STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT

January 4, 2007

INTERIOR/EXTERIOR REMODEL TOOELE ARMORY

UTAH NATIONAL GUARD
TOOELE, UTAH

DFCM Project Number 06193470

Vincent Design Group
401 East 1700 South
Salt Lake City, Utah 84115

TABLE OF CONTENTS

Current copies of the following documents are hereby made part of these contract documents by reference. These documents are available on the DFCM web site at http://dfcm.utah.gov or are available upon request from DFCM.

DFCM General Conditions dated May 25, 2005.
DFCM Application and Certification for Payment dated May 25, 2005.

Technical Specifications :
Drawings:

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at http://dfcm.utah.gov

NOTICE TO CONTRACTORS

Sealed bids will be received by the Division of Facilities Construction and Management (DFCM) for:

INTERIOR/EXTERIOR REMODEL – TOOELE ARMORY
UTAH NATIONAL GUARD – TOOELE, UTAH
DFCM PROJECT NO: 06193470

Bids will be in accordance with the Contract Documents that will be available at 9:00 AM on Thursday, January 4, 2007, and distributed in electronic format only on CDs from DFCM, 4110 State Office Building, Salt Lake City, Utah and on the DFCM web page at http://dfcm.utah.gov. For questions regarding this project, please contact Wayne Smith, DFCM, at 801 550-6536. No others are to be contacted regarding this bidding process. The construction budget for this project is $ 520,300.

A **mandatory** pre-bid meeting will be held at 9:00 AM on Wednesday, January 10, 2007 at the Tooele National Guard Armory, 16 South 1st Street, Tooele, Utah. All bidders wishing to bid on this project are required to attend this meeting.

Bids will be received until the hour of 1:00 PM on Wednesday, January 17, 2007 at Utah State Fairpark, Wasatch Building 155 North 1000 West, Salt Lake City, Utah. Bids will be opened and read aloud at the Wasatch Building at the Utah State Fairpark. NOTE: Bids must be received at Wasatch Building, Utah State Fairpark by the specified time.

A bid bond in the amount of five percent (5%) of the bid amount, made payable to the Division of Facilities Construction and Management on DFCM's bid bond form, shall accompany the bid.

The Division of Facilities Construction and Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of DFCM.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
Marla Workman, Contract Coordinator
4110 State Office Building, Salt Lake City, Utah 84114

PROJECT DESCRIPTION

All contractors wishing to bid this project must be pre-qualified under **ONE** of the following conditions:

1. Currently listed on DFCM State listing of approved general contractors

2. Successful completion of state construction projects within the last 3-5 years (submit a minimum of three projects and results by e-mail to wfsmith@utah.gov no later than 4:00 PM on Monday, January 8, 2007).

3. Contractors who have no history of state construction projects must submit a detailed five- year work history of at least three similar type projects in scope and magnitude to this particular project. Include also a management plan for this project identifying project management team, work experience, and management approach for successful completion. Submit packets to State Office Building Rm 4110, Salt Lake City, Utah, attention Wayne Smith, project manager, no later than 4:00 PM, Monday, January 8, 2007.

ONLY pre-qualified contractors will be allowed to attend the pre-bid meeting on Wednesday, January 10, 2007. Those contractors who are not currently on the DFCM general contractor listing will be contacted prior to the meeting if approval is granted.

This project is detailed and broad in scope, involving several different trades. The exterior portion consists of landscape demolition, new irrigation system, including new turf. Also, the exterior façade of the building will be covered in stucco over the existing brick. A new concrete approach to the building from the street to conform to ADA will also be installed. Interior work will involve building two new classrooms within open bays of the maintenance area of the building and associated work to complete access to the classroom area.

There are several alternates listed and it is the owner's intention and desire that all of the alternates be accepted, but this will be subject to the base bid AND ALTERNATES falling within the cost estimate for the project.

PROJECT SCHEDULE

PROJECT NAME:	**INTERIOR/EXTERIOR REMODEL – TOOELE ARMORY UTAH NATIONAL GUARD – TOOELE, UTAH**
DFCM PROJECT NO.	**06193470**

Event	Day	Date	Time	Place
Bidding Documents Available	Thursday	January 4, 2007	9:00 AM	DFCM 4110 State Office Bldg SLC, UT or DFCM web site *
Pre-Qualification Requirements	Monday	January 8, 2007	4:00 PM	DFCM 4110 State Office Bldg SLC, UT
Mandatory Pre-bid Site Meeting	Wednesday	January 10, 2007	9:00 AM	Tooele Natl Guard Armory 16 South 1st Street Tooele, UT
Last Day to Submit Questions	Friday	January 12, 2007	4:00 PM	wfsmith@utah.gov FAX 801-538-3267
Addendum Issued Responding to Questions (if needed)	Tuesday	January 16, 2007	4:00 PM	DFCM web site *
Prime Contractors Turn In Bid and Bid Bond	Wednesday	January 17, 2007	1:00 PM	Wasatch Building Utah State Fairpark 155 North 1000 West Salt Lake City, UT
Sub-contractor List Due	Thursday	January 18, 2007	1:00 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Wednesday	August 1, 2007		

* **NOTE: DFCM's web site address is http://dfcm.utah.gov**

** **Due to the ongoing construction on Capitol Hill and the anticipated shortage of parking during 2007, all bids will be received and opened at the Wasatch Building at the Utah State Fairpark. Refer to map on the DFCM web site for directions (http://dfcm.utah.gov/downloads/fairpark_map.pdf)**

BID FORM

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Notice to Contractors" and in accordance with the "Instructions to Bidders", in compliance with your invitation for bids for the **INTERIOR/EXTERIOR REMODEL – TOOELE ARMORY - UTAH NATIONAL GUARD – TOOELE, UTAH - DFCM PROJECT NO: 06193470** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

BASE BID: For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATE #1: Repair damaged area of existing maple drill floor

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATE #2: Re-paint drill hall walls and ceiling

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATE #3: Furr out and install gypboard finish over block walls in all classrooms, paint, install new rubber base_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATE #4: Replace 12 existing interior doors to match new door scheme

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by **August 1, 2007** should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$ 500.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in the Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract.

The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable l00% Performance and Payment bonds are not delivered within the time set forth.

Type of Organization: _____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

_____

Respectfully submitted,

_____
Name of Bidder

ADDRESS:

_____

_____

_____
Authorized Signature

INSTRUCTIONS TO BIDDERS

1. Drawings and Specifications, Other Contract Documents

Drawings and Specifications, as well as other available Contract Documents, may be obtained as stated in the Invitation to Bid.

2. Bids

Before submitting a bid, each contractor shall carefully examine the Contract Documents, shall visit the site of the Work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the Contract Documents. If the bidder observes that portions of the Contract Documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Representative and the necessary changes shall be accomplished by Addendum.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Invitation to Bid prior to the deadline for submission of bids.

Bid bond security, in the amount of five percent (5%) of the bid, made payable to the Division of Facilities Construction and Management, shall accompany bid. THE BID BOND MUST BE ON THE BID BOND FORM PROVIDED IN THE PROCUREMENT DOCUMENTS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID.

If the bid bond security is submitted on a bid bond form other than DFCM's required bid bond form, and the bid security meets all other legal requirements, the bidder will be allowed to provide an acceptable bid bond by the close of business on the next business day following notification by DFCM of submission of a defective bid bond security. **NOTE: A cashier's check cannot be used as a substitute for a bid bond.**

3. Contract and Bond

The Contractor's Agreement will be in the form found in the specifications. The Contract Time will be as indicated in the bid. The successful bidder, simultaneously with the execution of the Contract Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the contract sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for subcontractors will be specified in the Supplementary General Conditions.

4. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", which are included as part of these Contract Documents. The Subcontractors List shall be delivered to DFCM or faxed to DFCM at (801)538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the Contract Documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements is subject to a debarment hearing and may be debarred from consideration for award of contracts for a period of up to three years.

5. Interpretation of Drawings and Specifications

If any person or entity contemplating submitting a bid is in doubt as to the meaning of any part of the drawings, specifications or other Contract Documents, such person shall submit to the DFCM Project Manager a request for an interpretation thereof. The person or entity submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addenda posted on DFCM's web site at http://dfcm.utah.gov. Neither the DFCM nor A/E will be responsible for any other explanations or interpretations of the proposed documents. A/E shall be deemed to refer to the architect or engineer hired by DFCM as the A/E or Consultant for the Project.

6. Addenda

Addenda will be posted on DFCM's web site at http://dfcm.utah.gov. Contractors are responsible for obtaining information contained in each addendum from the web site. Addenda issued prior to the submittal deadline shall become part of the bidding process and must be acknowledged on the bid form. Failure to acknowledge addenda may result in disqualification from bidding.

7. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is reasonable, is in the interests of the State of Utah to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc.

8. DFCM Contractor Performance Rating

As a contractor completes each DFCM project, DFCM, the architect/engineer and the using agency will evaluate project performance based on the enclosed "DFCM Contractor Performance Rating" form. The ratings issued on this project will not affect this project but may affect the award on future projects.

9. Licensure

The Contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah.

10. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

11. Time is of the Essence

Time is of the essence in regard to all the requirements of the Contract Documents.

12. Withdrawal of Bids

Bids may be withdrawn on written request received from bidder prior to the time fixed for opening. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

13. Product Approvals

Where reference is made to one or more proprietary products in the Contract Documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the Contract Documents, the products of other manufacturers will be accepted, provided they equal or exceed the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the A/E. Such written approval must occur prior to the deadline established for the last scheduled addenda to be issued. The A/E's written approval will be in an issued addendum. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the A/E.

14. Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors

Contractors shall respond promptly to any inquiry in writing by DFCM to any concern of financial responsibility of the contractor, subcontractor or sub-subcontractor.

15. Debarment

By submitting a bid, the Contractor certifies that neither it nor its principals, including project and site managers, have been, or are under consideration for, debarment or suspension, or any action that would exclude such from participation in a construction contract by any governmental department or agency. If the Contractor cannot certify this statement, attach to the bid a detailed written explanation which must be reviewed and approved by DFCM as part of the requirements for award of the Project.

BID BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of $_____ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the _____ _____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this _____ day of _____, 20_____ .

Principal's name and address (if other than a corporation):

_____

_____

By: _____

Title: _____

Principal's name and address (if a corporation):

_____

_____

By: _____

Title: _____

(Affix Corporate Seal)

Surety's name and address:

_____

_____

By: _____

Attorney-in-Fact (Affix Corporate Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.
My Commission Expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, on the following basis:

PROJECTS UNDER $500,000 - ALL SUBS $20,000 OR OVER MUST BE LISTED
PROJECTS $500,000 OR MORE - ALL SUBS $35,000 OR OVER MUST BE LISTED

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- Bidder must list "Self" if performing work itself.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

BIDDER LISTING 'SELF' AS PERFORMING THE WORK:

Any bidder that is properly licensed for the particular work and intends to perform that work itself in lieu of a subcontractor that would otherwise be required to be on the subcontractor list, must insert the term 'Self' for that category on the subcontractor list form. Any listing of 'Self' on the sublist form shall also include the amount allocated for that work.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A.Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

GROUNDS FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for such other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

(1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
(2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
(3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
(4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
(5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
(6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #
ELECTRICAL	ABCD Electric Inc.	$350,000.00	123456789000
LANDSCAPING	"Self"	300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: 350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS SUBCONTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.

SUBCONTRACTORS LIST

FAX TO 801-538-3677

PROJECT TITLE: _____

Caution: You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

1. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: _____

DATE: _____ SIGNED BY: _____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR DFCMS REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY DFCM. ATTACH A SECOND PAGE IF NECESSARY.

FUGITIVE DUST PLAN

The Contractor will fill out the form and file the original with the Division of Air Quality and a copy of the form with the Division of Facilities Construction & Management, prior to the issuance of any notice to proceed.

The Contractor will be fully responsible for compliance with the Fugitive Dust Control Plan, including the adequacy of the plan, any damages, fines, liability, and penalty or other action that results from noncompliance.

Utah Division of Air Quality
April 20, 1999

GUIDANCE THAT MUST BE CONSIDERED IN DEVELOPING AND SUBMITTING A DUST CONTROL PLAN FOR COMPLIANCE WITH R307-309-3, 4, 5, 6, 7

Source Information:

1. Name of your operation (source): provide a name if the source is a construction site.

2. Address or location of your operation or construction site.

3. UTM coordinates or Longitude/Latitude of stationary emission points at your operation.

4. Lengths of the project, if temporary (time period).

5. Description of process (include all sources of dust and fugitive dust). Please, if necessary, use additional sheets of paper for this description. Be sure to mark it as an attachment.

6. Type of material processed or disturbed.

7. Amount of material processed (tons per year, tons per month, lbs./hr., and applicable units).

8. Destination of product (where will the material produced be used or transported, be specific, provide address or specific location), information needed for temporary relocation applicants.

9. Identify the individual who is responsible for the implementation and maintenance of fugitive dust control measures. List name(s), position(s) and telephone number(s).

10. List, and attach copies of any contract lease, liability agreement with other companies that may, or will, be responsible for dust control on site or on the project.

Description of Fugitive Dust Emission Activities
(Things to consider in addressing fugitive dust control strategies.)

1. Type of activities (drilling and blasting, road construction, development construction, earth moving and excavation, handling and hauling materials, cleaning and leveling, etc).

2. List type of equipment generating the fugitive dust.

3. Diagram the location of each activity or piece of equipment on site. Please attach the diagram.

4. Provide pictures or drawings of each activity. Include a drawing of the unpaved/paved road network used to move loads "on" and "off" property.

5. Vehicle miles travels on unpaved roads associated with the activity (average speed).

6. Type of dust emitted at each source (coal, cement, sand, soil, clay, dust, etc.)

7. Estimate the size of the release area at which the activity occurs (square miles). For haul or dirt roads include total miles of road in use during the activity.

Description of Fugitive Dust Emission Controls on Site

Control strategies must be designed to meet 20% opacity or less on site (a lesser opacity may be defined by Approval Order conditions or federal requirements such as NSPS), and control strategies must prevent exceeding 10% opacity from fugitive dust at the property boundary (site boundary) for compliance with R307-309-3.

1. Types of ongoing emission controls proposed for each activity, each piece of equipment, and haul roads.

2. Types of additional dust controls proposed for bare, exposed surfaces (chemical stabilization, synthetic cover, wind breaks, vegetative cover, etc).

3. Method of application of dust suppressant.

4. Frequency of application of dust suppressant.

5. Explain what triggers the use of a special control measure other than routine measures already in place, such as covered loads or measures covered by a permit condition (increase in opacity, high winds, citizen complaints, dry conditions, etc).

6. Explain in detail what control strategies/measures will be implemented off-hours, i.e., Saturdays/Sundays/Holidays, as well as 6 PM to 6 AM each day.

Description of Fugitive Dust Control Off-site

Prevent, to the maximum extent possible, deposition of materials, which may create fugitive dust on public and private paved roads in compliance with R307-309-5, 6, 7.

1. Types of emission controls initiated by your operation that are in place "off" property (application of water, covered loads, sweeping roads, vehicle cleaning, etc.).

2. Proposed remedial controls that will be initiated promptly if materials, which may create fugitive dust, are deposited on public and private paved roads.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Fugitive Dust Control Plan Violation Report

When a source is found in violation of R307-309-3 or in violation of the Fugitive Dust Control Plan, the course must submit a report to the Executive Secretary within 15 days after receiving a Notice of Violation. The report must include the following information:

1. Name and address of dust source.

2. Time and duration of dust episode.

3. Meteorological conditions during the dust episode.

4. Total number and type of fugitive dust activities and dust producing equipment within each operation boundary. If no change has occurred from the existing dust control plan, the source should state that the activity/equipment is the same.

5. Fugitive dust activities or dust producing equipment that caused a violation of R-307-309-3 or the sources dust control plan.

6. Reasons for failing to control dust from the dust generating activity or equipment.

7. New and/or additional fugitive dust control strategies necessary to achieve compliance with R307-309-3, 4, 5, 6, or 7.

8. If it can not be demonstrated that the current approved Dust Control Plan can result in compliance with R307-309-3 through 7, the Dust Control Plan must be revised so as to demonstrate compliance with 307-309-3 through 7. Within 30 days of receiving a fugitive dust Notice of Violation, the source must submit the revised Plan to the Executive Secretary for review and approval.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Attachments: DFCM Form FDR R-307-309, Rule 307-309

CONTRACTOR'S AGREEMENT

FOR:

_____
_____
_____

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _____, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _____, incorporated in the State of _____ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _____.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at _____ _____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by _____ and entitled "_____."

The DFCM General Conditions ("General Conditions") dated May 25, 2005 on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _____ _____ DOLLARS AND NO CENTS ($_____.00), which is the base bid, and which sum also includes the cost of a 100% Performance Bond and a 100%

Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete by _____. Contractor agrees to pay liquidated damages in the amount of $_____ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Invitation to Bid, Instructions to Bidders/ Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the Contractor requests payment and agrees to

safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor's Agreement. The Contractor shall not assign this Contractor's Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor's Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: _____

_____
Signature Date

Title: _____

State of _____)
)
County of _____) _____
Please type/print name clearly

On this ____ day of _____, 20____, personally appeared before me, _____, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _____ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

_____
Notary Public

(SEAL)

My Commission Expires _____

APPROVED AS TO AVAILABILITY OF FUNDS:

_____
David D. Williams, Jr. Date
DFCM Administrative Services Director

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

_____
_____- Manager Date
Capital Development/Improvements

APPROVED AS TO FORM:
ATTORNEY GENERAL
November 30, 2006
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

_____
Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That _____ hereinafter referred to as the "Principal" and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee, " in the amount of _____ _____ DOLLARS ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____, for the approximate sum of _____ _____ Dollars ($_____), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20_____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)

) ss.

COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

DFCM FORM 1b 113006

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____ _____, a corporation organized and existing under the laws of the State of _____authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____ for the approximate sum of _____ _____ Dollars ($_____), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, l953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____ _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

DFCM FORM 1b 113006

CHANGE ORDER #_____

CONTRACTOR:

ARCHITECT:

AGENCY OR INSTITUTION:
PROJECT NAME:
PROJECT NUMBER:
CONTRACT NUMBER:
DATE:

CONSTRUCTION CHANGE DIRECTIVE NO.	PROPOSAL REQUEST NO.	AMOUNT		DAYS	
		INCREASE	DECREASE	INCREASE	DECREASE

	Amount	Days	Date
ORIGINAL CONTRACT			
TOTAL PREVIOUS CHANGE ORDERS			
TOTAL THIS CHANGE ORDER			
ADJUSTED CONTRACT			

DFCM and Contractor agree that the terms, contract sum, scope of the Work and time specified in this Change Order shall constitute the full accord and satisfaction, and complete adjustment to the Contract and includes all direct and indirect costs and effects related to, incidental to, and/or reasonably implied from such change in the contract terms, sum, scope of the Work and time.

Contractor:_____
Date

Architect/Engineer:_____
Date

Agency or Institution:_____
Date

DFCM: _____
Date

Funding Verification:_____
Date

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT _____ PROJECT NO: _____
AGENCY/INSTITUTION _____

AREA ACCEPTED _____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM - (Owner) accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _____ (time) on _____ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

_____

_____

The Owner acknowledges receipt of the following closeout and transition materials:

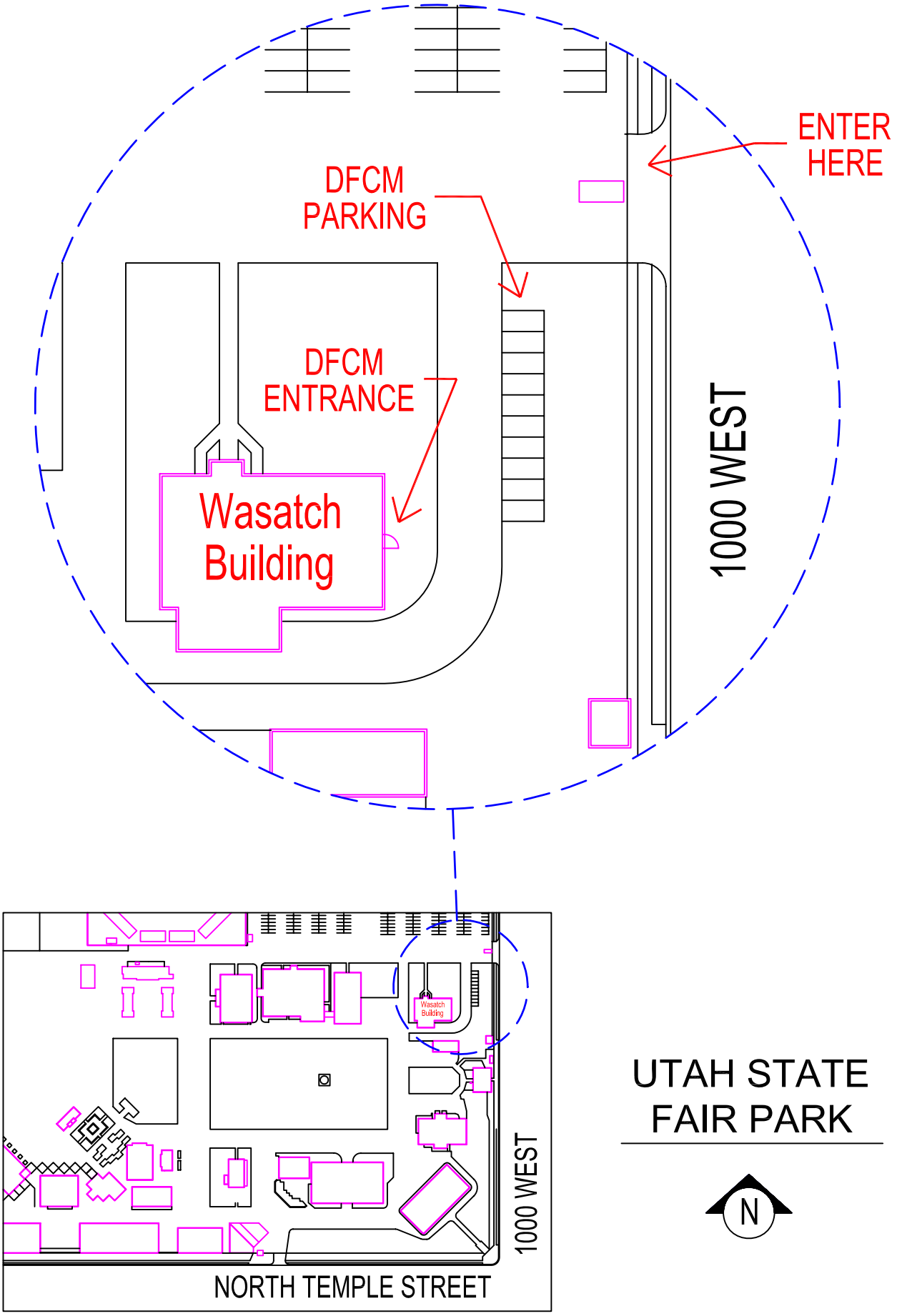
☐ As-built Drawings ☐ O & M Manuals ☐ Warranty Documents ☐ Completion of Training Requirements

A list of items to be completed or corrected (Punch List) is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof. The amount of _____(Twice the value of the punch list work) shall be retained to assure the completion of the punch list work.

The Contractor shall complete or correct the Work on the list of (Punch List) items appended hereto within _____ _____calendar days from the above date of issuance of this Certificate. The amount withheld pending completion of the list of items noted and agreed to shall be: $_____. If the list of items is not completed within the time allotted the Owner has the right to be compensated for the delays and/or complete the work with the help of independent contractor at the expense of the retained project funds. If the retained project funds are insufficient to cover the delay/completion damages, the Owner shall be promptly reimbursed for the balance of the funds needed to compensate the Owner.

_____	by:	_____	
CONTRACTOR (include name of firm)		(Signature)	DATE
_____	by:	_____	
A/E (include name of firm)		(Signature)	DATE
_____	by:	_____	
USING INSTITUTION OR AGENCY		(Signature)	DATE
_____	by:	_____	
DFCM (Owner)		(Signature)	DATE

4110 State Office Building, Salt Lake City, Utah 84114 cc: Parties Noted
telephone 801-538-3018 • facsimile 801-538-3267 • http://dfcm.utah.gov DFCM, Director



DFCM Temporary Location

S P E C I F I C A T I O N

REMODEL OF
NATIONAL GUARD ARMORY

at

300 East Vine Street
Tooele, Utah

TITLE SUBJECT

INDEX

LIST OF DRAWINGS

SHT. NO.	
AS-101	TITLE SHEET
AS-102	SITE PLAN, SCHEDULES, DETAILS, AND NOTES
AE-101	DEMOLITION PLAN AND NOTES
AE-102	FLOOR PLAN, SCHEDULES AND DETAILS
AE-103	ELEVATIONS AND DETAILS
AE-104	FLOOR FRAMING AND SECTIONS
AE-105	REFLECTED CEILING PLAN, SECTIONS AND DETAILS
M-1.00	MECHANICAL PLAN AND DETAILS
M-1.01	MECHANICAL DETAILS, SPECIFICATION, SCHEDULES AND NOTES
E-1.1	ELECTRICAL NOTES AND SCHEDULES
E-2.1	LIGHTING PLAN
E-3.1	POWER PLAN

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Proposed products list.

D. Shop drawings.

E. Product data.

F. Samples.

G. Manufacturers' instructions.

H. Manufacturers' certificates.

1.02 RELATED SECTIONS

A. Section 01400 - Quality Control: Manufacturers' field services and reports.

B. Section 01700 - Contract Closeout: Contract, warranty, and manufacturer's certificates and closeout submittals.

1.03 SUBMITTAL PROCEDURES

A. Transmit each submittal to Architect/Engineer for approval.

B. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number (s) and specification section number, as appropriate.

C. Apply Contractor's stamp, signed or initialled certifying that review, verification of products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the work and contract documents.

D. Schedule submittals to expedite the project, and deliver to Architect/Engineer at business address. Coordinate submittal of related items.

E. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed work.

F. Provide space for Contractor and Architect/Engineer review stamps.

G. Revise and resubmit submittals as required; identify all changes made since previous submittal.

H. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.04 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial progress schedule in duplicate within 20 days after date established in Notice to Proceed for Architect/Engineer review.

B. Revise and resubmit as required.

C. Submit computer generated network analysis diagram using the critical path, PERT method, or generally as outlined in Associated General Contractors of American (AGC) publication "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".

D. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

E. Indicate estimated percentage of completion for each item of work at each submission.

F. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those Owner furnished and under allowances.

1.05 SHOP DRAWINGS

A. Submit the number of opaque reproductions which Contractor requires, plus four copies which will be retained by Architect/Engineer.

B. After review, reproduce and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01700 - Contract Closeout.

1.06 PRODUCT DATA

A. Submit the number of copies which the Contractor requires, plus four copies which will be retained by the Architect/Engineer.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this project.

C. After review distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01700 - Contract Closeout.

1.07 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of the product with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect/Engineer's selection.

C. Include identification on each sample with full project information.

D. Submit the number of samples specified in individual specification sections; one of which will be retained by Architect/Engineer.

E. Reviewed samples which may be used in the work are indicated in individual specification sections.

1.08 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing in quantities specified for Product Data.

B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.09 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification sections, submit manufacturers' certificate to Architect/Engineer for review in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect/Engineer.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Quality assurance and control of installation.

B. References.

C. Field samples.

D. Inspection and testing laboratory services.

E. Manufacturers' field services and reports.

1.02 RELATED SECTIONS

A. Section 01300 - Submittals Submission of Manufacturers' Instructions and Certificates.

B. Section 01600 - Material and Equipment: Requirements for material and product quality.

1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality.

B. Comply fully with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

D. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.04 REFERENCES

A. Conform to reference standard by date of issue current on date of Contract Documents.

B. Obtain copies of standards when required by Contract Documents.

C. Should specified reference standards conflict with Contract Documents, request clarification for Architect/Engineer before proceeding.

D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 FIELD SAMPLES

A. Install field samples at the site as required by individual specifications sections for review.

B. Acceptable samples represent a quality level for the work.

C. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by Architect/Engineer.

1.06 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations. Observer subject to approval of Architect/Engineer.

B. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report in duplicate within 30 days of observation to Architect/Engineer for review.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Products.

B. Transportation and handling.

C. Storage and protection.

D. Product options.

E. Substitutions.

1.02 RELATED SECTIONS

A. Section 01400 - Quality Control: Product quality monitoring.

1.03 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the work.

B. Provide interchangeable components of the same manufacturer for similar components.

1.04 TRANSPORTATION AND HANDLING

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.05 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weathertight, climate controlled enclosures.

B. For exterior storage of fabricated products, place on sloped supports above ground.

C. Provide off-site storage and protection when site does not permit on-site storage or protection.

D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

E. Store loose granular materials on solid flat surfaces in a well-drained area. Provide mixing with foreign matter.

F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are

undamaged and are maintained under specified conditions.

1.06 PRODUCT OPTIONS

A. Products specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not named.

1.07 SUBSTITUTIONS

A. Architect/Engineer will consider requests for substitutions only within 5 days of Bid Opening.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

D. A request constitutes a representation that the Bidder:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other work which may be required for the work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.
   5. Will reimburse Owner for review or redesign services associated with reapproval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence.
   3. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Adjusting.

D. Project record documents.

E. Operation and maintenance data.

F. Warranties.

G. Spare parts and maintenance materials.

1.02 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect/Engineer's inspections, Owner prefinal and final.

B. Provide submittals to Architect/Engineer and Owner that are required by governing or other authorities.

C. Submit final Application for Payment identifying total adjusted contract sum, previous payments, and sum remaining due.

D. Owner will occupy all portions of the building upon final acceptance of project.

1.03 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Clean equipment and fixtures to a sanitary condition.

D. Clean and replace filters of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean site, sweep paved areas, rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.04 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 PROJECT RECORD DOCUMENTS

A. Maintain on site, one set of the following record documents; record actual revisions to the work:

1. Contract drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the contract.
5. Reviewed shop drawings, product data, and samples.

B. Store record documents separate from documents used for construction.

C. Record information concurrent with construction progress.

D. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

E. Record documents and shop drawings: Legibly mark each item to record actual construction including.

F. Submit documents to Architect/Engineer with claim for final Application for Payment.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit three sets prior to final inspection bound in 8-1/2 x 11 inch text pages, three ring binders with durable plastic covers.

B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of project.

C. Internally subdivide the binder contents with permanent page dividers logically organized as described below with tab titling clearly printed under reinforced laminated plastic tabs.

D. Contents: Prepare a Table of Contents for each volume, with each product or system description identified.

E. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.

F. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. Identify the following:
1. Significant design criteria.
2. List of equipment.
3. Parts list for each component.
4. Operating instructions.
5. Maintenance instructions for equipment and systems.
6. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.

G. Part 3: Project documents and certificates, including the following:
1. Shop drawings and product data.
2. Air and water balance reports.
3. Certificates.
4. Photocopies of warranties.

H. Submit one copy of completed volumes in final form at prefinal inspection. This copy will be returned with Architect/Engineer comments. Revise content of documents as required prior to final submittal.

I. Submit final volumes revised within ten days after final inspection.

1.07 WARRANTIES

A. Provide duplicate notarized copies.

B. Execute and assemble documents from subcontractors, suppliers, and manufacturers.

C. Submit prior to final Application for Payment.

1.08 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.

B. Deliver to project site and place in location as directed by Owner; obtain receipt prior to final payment.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02072

DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cutting of concrete and masonry floor and walls for new work, etc.

B. Other miscellaneous demolition items: doors, floor, walls, electrical, mechanical, equipment, etc.; see drawings.

1.02 REGULATORY REQUIREMENTS

A. Submit under provisions of GENERAL CONDITIONS.

1.03 REGULATORY REQUIREMENTS

A. Conform to I.C.B. code for demolition work, safety of structure, dust control and Owner access and exit requirements.

B. Notify Owner on affected utilities before starting work and comply with their requirements.

C. Do not close or obstruct egress width to exits.

D. Conform to procedures applicable when discovering hazardous or contaminated materials.

1.04 SEQUENCING

A. Sequence work under the provisions of GENERAL CONDITIONS and Owner operations.

B. Note that building will remain in operation during construction period.

1.05 SCHEDULING

A. Schedule work to coincide with new remodel, equipment change, conditions.

B. Describe demolition removal procedures and schedule with Owner and Architect before commenting work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 PREPARATION

A. Provide, erect, and maintain temporary barriers at locations required by remodel work.

B. Protect existing materials and Owner equipment and fixtures which are not to be demolished.

C. Mark location of utilities and verify with Owner before commencing cutting where utility lines are located.

3.02 DEMOLITION REQUIREMENTS

A. Conduct demolition to minimize interference with adjacent and occupied building spaces.

B. Maintain protected egress and access to the Work.

3.03 DEMOLITION

A. Disconnect, remove, cap, and identify designated utilities within demolition areas. Make sure that Owner's equipment is isolated and off prior to cutting. Reconnect services immediately to Owner equipment required for business functions.

B. Disconnect existing mechanical equipment and electrical only when replacement fixtures and equipment are at the site for as short an interruption as possible.

C. Demolish in an orderly and careful manner. Protect existing supporting structural members and provide any necessary shoring and bracing required.

D. Remove and legally dispose of all demolished materials from site as work progresses. Upon completion of work, leave areas in clean condition.

E. Remove temporary work.

END OF SECTION

SECTION 02211

ROUGH GRADING & EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of vegetation (shrubs, weeds, trees, etc.), fences, and subsoil.

B. Cutting, grading, and rough contouring the site.

C. Contractor to provide Utah licensed survey engineering company for building and site project layout.

D. Excavation for building exterior ramp and slabs-on-grade.

1.02 RELATED SECTIONS

A. Quality Control: Inspection of bearing surfaces - see GENERAL CONDITIONS.

B. Section 02223 - Backfilling: General building area backfilling.

C. Section 02225 - Trenching: Trenching and backfilling for utilities.

1.03 REFERENCES

A. ANSI/ASTM D698 - Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures.

B. ANSI/ASTM D1557-78 - Test Method for Density of Soil.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of GENERAL CONDITIONS.

B. Accurately record actual locations of utilities remaining, by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Excavated material, graded, free of roots, rocks larger than 2 inches, subsoil, debris, and large weeds.

B. Subsoil: Excavated material, graded, free of lumps larger than 6 inches, rocks larger than 3 inches, and debris.

C. Granular Fill: Type specified in Section 02223.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions, building location, and site improvements.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Identify known underground, above ground, and aerial utilities. Stake and flag locations.

C. Notify Utility Company for locations of all utilities.

D. Protect above and below grade utilities which are to remain.

E. Protect bench marks, existing structures, fences, roads, paving, and curbs which are to remain from excavation equipment and vehicular traffic.

3.03 SUBSOIL EXCAVATION

A. Excavate subsoil required to accommodate foundations and slabs-on-grade.

B. Excavation cut not to interfere with normal 45 degree bearing splay of foundation.

C. Grade top perimeter of excavation to prevent surface water from draining into excavation.

D. Hand trim excavation. Remove loose matter.

E. Remove lumped subsoil, boulders, and rock.

F. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

G. Correct unauthorized excavation at no extra cost to Owner.

H. Correct areas overexcavated by error in accordance with Section 02223.

I. Excavate subsoil from areas to be further excavated, regraded; see Site Plan for designated areas.

J. Stockpile in area designated on site. Remove excess subsoil not being reused from site.

3.04 FILLING

A. Fill areas to contours and elevations with unfrozen materials.

B. Granular Fill: Place and compact materials in continuous layers not exceeding 8 inches compacted depth, compacted to 95 percent in areas below concrete footings, slabs, and asphalt paving.

C. Subsoil Fill: Place and compact material in continuous layers not exceeding 8 inches compacted depth, compacted to 95 percent.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Slope grade away from building minimum 3 inches in 10 feet, unless noted otherwise.

F. Make grade changes gradual. Blend slope into level areas.

G. Remove surplus fill materials from site.

3.05 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 1/10 foot.

3.06 FIELD QUALITY CONTROL

A. Field inspection and testing as hired by the Owner as deemed necessary will be performed under provisions of GENERAL CONDITIONS.

B. Provide for visual inspection of bearing surfaces.

C. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D698 and D1557 and with GENERAL CONDITIONS.

D. Compaction testing will be performed in accordance with Section 02223.

E. If tests indicate work does not meet specified requirements, remove work, replace, and retest at no cost to Owner.

F. Frequency of tests as follows:
1. Take (1) compaction test per lift per each 50 lineal feet of continuous building foundation.
2. Slabs and flatwork will need (1) test per each 1,000 sq. ft. each lift.
3. Trenches will need one (1) test for compaction per each 50 lin. ft. each lift.
4. Spot foundation: One test per lift per each spot footing or isolated foundation.

3.08 PROTECTION

A. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 02223

BACKFILLING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building perimeter backfilling to subgrade elevations.

B. Site filling and backfilling.

C. Fill under slabs-on-grade and paving.

D. Consolidation and compaction under footings and slabs.

E. Fill for over-excavation.

1.02 RELATED SECTIONS

A. Section 02222 - Excavation.

B. Section 02225 - Trenching: Backfilling of utility trenches.

C. Section 03300 - Cast-in-Place Concrete: Concrete materials.

D. General Conditions - Consolidation and compaction testing.

1.03 REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.

C. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18 inch Drop.

1.04 SUBMITTALS

A. Submit under provisions of GENERAL CONDITIONS and test data requested material to use and sources.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. Type A - Granular Material: Pit run, washed natural stone; free of shale, clay, friable material, sand, debris; graded in accordance with ANSI/ASTM C136. See soils engineering report and material specification

B. Subsoil: Reused, free of gravel larger than 3 inch size, and debris; see Soils Report.

C. Concrete: Structural concrete conforming to Section 03300.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify fill materials to be reused are acceptable.

3.02 PREPARATION

A. Generally, compact subgrade to density requirements for subsequent backfill materials.

B. Cut out soft areas of subgrade not capable of insitu compaction. Backfill with Type A fill and compact to density equal to or greater than requirements for subsequent backfill material.

C. Prior to placement of aggregate base course material at floor slabs and paved areas, compact subsoil to 95 percent of its maximum dry density in accordance with ANSI/ASTM D698 and soil engineer's report.

3.03 BACKFILLING

A. Backfill areas to contours and elevations with unfrozen materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

C. Granular Fill: Place and compact materials in continuous layers not exceeding 8 inches compacted depth.

D. Soil Fill: Place and compact material in continuous layers not exceeding 8 inches compacted depth.

E. Employ a placement method that does not disturb or damage foundations.

F. Maintain optimum moisture content of backfill materials to attain required compaction density.

G. Backfill against supported foundation walls both interior and exterior. Do not backfill against unsupported foundation walls.

H. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.

I. Slope grade away from building minimum 3 inches in 10 ft unless noted otherwise.

J. Make changes gradual. Blend slope into level areas.

K. Remove surplus backfill materials from site.

L. Leave fill material stockpile areas completely free of excess fill materials.

3.04 TOLERANCES

A. Top Surface of Backfilling Under Slabs: Plus or minus one inch from required elevations.

3.05 FIELD QUALITY CONTROL

A. Field inspection and testing as procured by Owner will be performed under provisions of GENERAL CONDITIONS.

B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D698, with GENERAL CONDITIONS, and by soil engineer's report provided by Owner.

C. Compaction testing will be performed in accordance with ANSI/ASTM D698 and with GENERAL CONDITIONS.

D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

E. Frequency of Tests: See engineer's report.

F. Proof roll compacted fill surfaces under slabs-on-grade.

3.06 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of GENERAL CONDITIONS.

B. Recompact fills subjected to vehicular traffic.

3.07 SCHEDULE

A. Fill Under Concrete Walks and Slabs-on-grade:
   1. Granular material fill, to 4 inches below finish paving elevation, compacted to 90 percent.

C. Fill for Over Excavation:
   1. Granular material fill as required to bring over excavation to below finish grade, compacted to 95 percent if under building structure. To be 90 percent elsewhere.

END OF SECTION

SECTION 02225

TRENCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavate trenches for utilities from foundation outside building to lines shown on drawings and existing building services.

B. Compacted bedding under fill over utilities to subgrade elevations.

C. Backfilling and compaction.

1.02 RELATED SECTIONS

A. GENERAL CONDITIONS: Testing fill compaction.

B. Section 02211 - Rough Grading: Paving, topsoil and subsoil removal from site surface.

C. Section 02222 - Excavation: General building excavation.

D. Section 02223 - Backfilling: General backfilling.

E. Section 03300 - Cast-in-Place Concrete: Concrete materials.

1.03 REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

1.04 FIELD MEASUREMENTS

A. Verify that survey benchmark and intended elevations for the Work are as shown on Drawings.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. Types of materials as specified in Section 02223.

2.02 BED MATERIALS

A. Type of Material: As specified for Type A in Section 02223.

B. Type of Material: As specified for Type B in Section 02223.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify fill materials to be reused, is acceptable.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Maintain and protect existing utilities remaining, which pass through work area.

C. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.

D. Protect above and below grade utilities which are to remain.

E. Cut out soft areas of subgrade not capable of insitu compaction. Backfill with Type 2 fill and compact to density equal to or greater than requirements for subsequent backfill material.

3.03 EXCAVATION

A. Excavate subsoil required for utilities and site irrigation system.

B. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.

C. Excavation shall not interfere with normal 45 degree bearing splay of foundations.

D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

E. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume.

F. Correct unauthorized excavation at no cost to Owner.

G. Correct areas over-excavated by error in accordance with Section 02222.

H. Stockpile excavated material in area designated on site and remove excess material not being used, from site.

3.04 BEDDING

A. Support pipe and conduit during placement and compaction of bedding fill.

3.05 BACKFILLING

A. Backfill trenches to contours and elevations with unfrozen materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

C. Granular Fill: Place and compact materials in continuous layers not exceeding 8 inches compacted depth where called for on drawings.

D. Soil Fill: Place and compact material in continuous layers not exceeding 8 inches compacted depth.

E. Employ a placement method that does not disturb or damage plumbing piping or conduit in trench.

F. Maintain optimum moisture content of backfill materials to attain required compaction density.

G. Remove surplus backfill materials from site.

H. Leave fill material stockpile areas completely free of excess fill materials.

3.06 TOLERANCES

A. Top Surface of General Backfilling: Plus or minus one inch from required elevations.

3.07 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of GENERAL CONDITIONS.

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.08 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of GENERAL CONDITIONS.

B. Recompact fills subjected to vehicular traffic.

END OF SECTION

SECTION 02811

LANDSCAPE IRRIGATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe and fittings, valves, outlets, sprinklers, bubblers, and accessories. Contractor to design system.

B. Connection to utilities.

C. Control system.

1.02 RELATED SECTIONS

A. Plumbing: Water supply - tie into City irrigation system..

B. Section 16100 - Electrical: Electric supply.

1.03 REFERENCES

A. ANSI/ASTM D2282 - Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (SDR-PR).

B. ANSI/ASTM D2564 - Solvent Cement for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.

C. ASTM D2235 - Solvent Cement for Acrylonitrile- Butadiene-Styrene (ABS) Plastic Pipe and Fittings.

D. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).

1.04 SYSTEM DESCRIPTION

A. Electric solenoid controlled underground irrigation system, with low point self drain.

1.05 SUBMITTALS

A. Submit under provisions of GENERAL CONDITIONS.

B. Shop Drawings: Indicate piping layout to water source, location of sleeves under pavement, location and coverage of sprinkler heads, plant and landscaping features, site structures, schedule of fittings to be used.

C. Product Data: Provide component and control system and wiring diagrams.

D. Manufacturer's Installation Instructions: Include controller.

1.06 PROJECT RECORD DOCUMENTS

A. Submit under provisions of GENERAL CONDITIONS.

B. Accurately record actual locations of piping system.

1.07 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of GENERAL CONDITIONS.

B. Provide instructions for operation and maintenance of system and controls, seasonal activation and shutdown, and manufacturer's parts catalog.

C. Provide schedule indicating length of time each valve is required to be open to provide a determined

amount of water.

1.08 REGULATORY REQUIREMENTS

A. Conform to Utah State code for piping and component requirements.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of products in system.

1.09 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on Drawings.

1.10 EXTRA MATERIALS

A. Provide the following extra components under provisions of GENERAL CONDITIONS.
1. Two sprinkler heads of each type and size.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Rainbird

B. Toro

C. Substitutions: Under provisions of GENERAL CONDITIONS.

2.02 MATERIALS

A. Pipe: PVC in accordance with ASTM D2241; Schedule 40, 200 psi solvent-weld sockets.

B. Fittings: Type and style of connection to match pipe.

C. Solvent Cement: ANSI/ASTM D2564 for PVC pipe and fittings, ASTM D2235 for ABS pipe and fittings.

D. Sleeve Material: P. V. C. (4").

2.03 OUTLETS

A. Rotary Type Sprinkler Head: Pop-up type with screens; fully adjustable for flow and pressure; size as indicated; with letter or symbol designating degree of arc and arrow indicating center of spray pattern.

B. Spray Type Sprinkler Head: Pop-up head with full circle, half circle, quarter circle patterns (4" pop up).

C. Emitter: Adjustable outlet, non-clogging, with two trickle tubes.

D. Bubbler: Adjustable outlet.

E. Quick Coupler.

2.04 VALVES

A. Gate Valves: Bronze construction, nonrising stem, inside screw with threaded ends.

B. Stop & Waste and Backflow Preventers: Bronze body construction, double check valve type.

C. Valve Box and Cover: Vinyl.

D. Drain Valve: In line type.

2.05 CONTROLS

A. Controller: Automatic controller, micro-processor solid state control with visible readout display, temporary override feature to bypass cycle for inclement weather, timer for a 12 station system, programmable 3 programs for 7 days in quarter hour increments, with automatic start and shutdown.

B. Electric Solenoid: Normally closed valves to control wiring, including required fittings and accessories.

C. Wire: Color coded.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify location of existing utilities.

C. Verify that required utilities are available, in proper location and ready for use.

D. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Piping layout indicated is design build by Landscape Contractor. Route piping to avoid plants and structures.

B. Layout and stake locations of system components.

C. Review layout requirements with other affected work. Coordinate locations of sleeves [under paving] to accommodate system.

3.03 TRENCHING

A. Trench and backfill in accordance with Section 02225.

B. Minimum Trench Width: 6 inches.

C. Minimum Trench Depth: 6 inches.

D. Trench to accommodate grade changes and slope to drains.

E. Maintain trenches free of debris, material, or obstructions that may damage pipe.

3.04 INSTALLATION

A. Install pipe, valves, controls, and outlets in accordance with manufacturer's instructions.

B. Connect to water and electrical service.

C. Set sprinkler heads and box covers at finish grade elevations.

D. Provide for thermal movement of components in system.

E. Use threaded nipples for risers to each outlet to facilitate easy replacement.

F. Install control wiring. Provide 10 inch expansion coil at each valve to which controls are connected, and at 100 ft intervals. Bury wire beside pipe. Mark valves with neoprene valve markers containing locking device.

G. After piping is installed but before sprinkler heads are installed and backfilling commences, open valves and flush system with full head of water.

3.05 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of GENERAL CONDITIONS.

B. Prior to backfilling, test system for leakage for whole system to maintain 100 psi pressure for one hour. System acceptable if no leakage or loss of pressure occurs during test period.

3.06 BACKFILLING

A. Backfill trench and compact to subgrade elevation as specified in Section 02223. Protect piping from displacement.

B. Replace Work damage by the work of this Section with equivalent products.

3.07 INSTALLER'S FIELD SERVICES

A. Prepare and start systems under provisions of GENERAL CONDITIONS.

B. Provide one complete spring startup and a fall shutdown.

3.08 ADJUSTING

A. Adjust work under provisions of GENERAL CONDITIONS.

B. Adjust control system to achieve time cycles required.

C. Change head types as directed.

3.09 DEMONSTRATION

A. Provide system demonstration under provisions of GENERAL CONDITIONS.

B. Instruct Owner's personnel in operation and maintenance of system, including adjusting of sprinkler heads. Use operation and maintenance material as basis for demonstration.

3.10 SCHEDULES

A. Perimeter of Grassed Areas: Pop-Up half circle heads.

B. Corners of Grassed Areas: Pop-Up quarter circle heads.

C. Within Grassed Areas: Pop-Up full circle heads.

D. Planters: Fixed square pattern head, and one emitter per 4 sq ft of planter area.

E. Design by Landscape contractor.

END OF SECTION

SECTION 02921

LANDSCAPE GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Final grade topsoil for finish landscaping.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 02211 - Rough Grading: Site subsoil contouring.

C. Section 02223 - Backfilling: Backfilling at building areas.

D. Section 02225 - Trenching: Backfilling trenches.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Reused and imported as required.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify fill material to be reused is acceptable.

B. Verify building and trench backfilling has been inspected.

C. Verify subsoil base has been contoured and compacted.

3.02 SUBSOIL PREPARATION

A. Eliminate uneven areas and low spots.

B. Remove debris, roots, branches, and stones in excess of 3/4 inch in size. Remove subsoil contaminated with petroleum products.

C. Scarify subgrade to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment is used for hauling and spreading topsoil and has compacted subsoil.

3.03 PLACING TOPSOIL

A. Place topsoil in areas where sodding and planting are required to a nominal depth of 6 inches.

B. Use topsoil in relatively dry state. Place during dry weather.

C. Fine grade topsoil, eliminating rough or low areas. Maintain profiles and contour of subgrade. Maintain minimum slope of 4% away from building per Code.

D. Remove roots, weeds and foreign materials while spreading.

E. Manually spread topsoil close to trees, plants, and building to prevent damage.

F. Lightly compact or roll placed topsoil.

G. Remove surplus subsoil and topsoil from site.

H. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.04 TOLERANCES

A. Top of Topsoil: Plus or minus 1/2 inch.

3.05 PROTECTION

A. Protect landscaping and other features remaining as final work.

B. Protect existing structures, fences, roads, and utilities.

3.06 SCHEDULES

A. Compacted topsoil thickness at the following areas:
   1. Sod: 6 inches
   2. Shrub Beds: 18 inches
   3. Flower Beds: 12 inches.

END OF SECTION

SECTION 02950

TREES, PLANTS, AND SODDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation of topsoil.

B. Topsoil bedding.

C. Trees, plants, and ground cover.

D. Mulch.

E. Maintenance.

1.02 RELATED SECTIONS

A. Section 02223 - Backfilling: Rough grading of site.

B. Section 02225 - Trenching: Rough grading over trench cut.

C. Section 02811 - Underground Sprinkler System.

1.03 REFERENCES

A. ANSI Z60.1 - Nursery Stock.

B. FS O-F-241 - Fertilizers, Mixed, Commercial.

1.04 DEFINITIONS

A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

B. Plants: Living trees, plants, and sod specified in this Section and described in ANSI Z60.1.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit instructions for continuing Owner maintenance under provisions of GENERAL CONDITIONS.

B. Include cutting and trimming methods; types, application frequency, and recommended coverage of fertilizer; and watering.

1.06 QUALITY ASSURANCE

A. Nursery: Company specializing in growing and cultivating the plants specified in this Section with minimum three years experience.

B. Installer: Company specializing in installing and planting the plants specified in this Section with minimum 3 years experience and approved by nursery.

1.07 REGULATORY REQUIREMENTS

A. Comply with regulatory requirements for fertilizer and herbicide composition.

B. Plant Materials: Certified by state department of agriculture; free of disease or hazardous insects.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of GENERAL CONDITIONS.

B. Store and protect products under provisions of GENERAL CONDITIONS.

C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

D. Protect plants until planted.

E. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Do not install plant life when ambient temperatures may drop below 35 degrees or above 90 degrees F.

B. Do not install plants when wind velocity exceeds 30.

1.10 SEQUENCING AND SCHEDULING

A. Coordinate work under provisions of GENERAL CONDITIONS.

B. Coordinate the work of this Section with installation of underground irrigation system, utilities, piping and watering heads.

1.11 WARRANTY

A. Provide a warranty on work of this Section for a minimum one year including one continuous growing season. Commence warranty on date identified in the Certificate of Substantial Completion.

B. Warranty: Include coverage of plants from death or unhealthy conditions.

C. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

1.12 MAINTENANCE SERVICE

A. Maintenance Services: Performed by installer.

B. Maintain plant life for three months after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 TREES, PLANTS, AND GROUND COVER

A. Trees, Plants, and Sodding: Species and size identifiable in plant schedule, grown in climatic conditions similar to those in locality of the Work.

2.02 SOIL MATERIALS

A. Topsoil: Excavated from site and imported as needed.

2.03 ACCESSORIES

A. Wrapping Materials: Burlap.

B. Stakes: Softwood lumber, pointed end.

C. Plant Pot: Vinyl.

D. Decorative Cover: Fir bark chips.

E. Mow strips around planters and at all property lines.

2.04 TESTS

A. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared subsoil and planters are ready to receive work of this Section.

B. Verify that required underground utilities are available, in proper location, and ready for use.

C. Beginning to installation means acceptance of existing conditions.

3.02 PREPARATION OF SUBSOIL

A. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

B. Remove foreign materials, weeds, and undesirable plants and their roots. Remove contaminated subsoil.

C. Scarify subsoil to a depth of 3 inches where plants are to be placed. Repeat cultivation in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

D. Dig pits and beds 6 inches larger than plant root system.

3.03 PLACING TOPSOIL

A. Spread topsoil to a minimum depth of 6 inches over area to be planted. Rake smooth.

B. Place topsoil during dry weather and on dry unfrozen subgrade.

C. Remove vegetable matter and foreign nonorganic material from topsoil while spreading.

D. Grade topsoil to eliminate rough, low, or soft areas, and to ensure positive drainage.

E. Install topsoil mixture in pits and beds intended for plant root balls, to a minimum thickness of 6 inches.

3.04 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after initial raking of topsoil.

C. Mix thoroughly into upper 2 inches of topsoil.

D. Lightly water to aid the dissipation of fertilizer.

3.05 PLANTING

A. Place plants for best appearance and for review and final orientation by Architect/Engineer.

B. Set plants vertical.

C. Remove non-biodegradable root containers.

D. Set plants in pits or beds, partly filled with prepared topsoil mixture. Loosen burlap, ropes, and wires from the root ball.

E. Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 6 inch layers. Maintain plant materials in vertical position.

F. Saturate soil with water when the pit or bed is half full of topsoil and again when full.

G. Lay sod material out butting tightly together in even, flat sections; water planting to a soak condition.

3.06 INSTALLATION OF ACCESSORIES

A. Place decorative bark cover where indicated on Drawings in all exposed soil areas.

3.07 PLANT SUPPORT

A. Brace plants vertically with plant protector wrapped guy wires and stakes when necessary.

3.08 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of GENERAL CONDITIONS.

B. Plants will be rejected when ball of earth surrounding roots has been disturbed or damaged prior to or during planting.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.

B. Openings for other work.

C. Form accessories.

D. Form stripping.

1.02 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

A. Section 03300 - Cast-In-Place Concrete: Supply of concrete accessories for placement by this Section.

1.03 RELATED SECTIONS

A. Section 03200 - Concrete Reinforcement.

B. Section 03300 - Cast-in-Place Concrete.

1.04 REFERENCES

A. ACI 347 - Recommended Practice For Concrete Formwork.

B. PS-1 - Construction and Industrial Plywood.

1.05 DESIGN REQUIREMENTS

A. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 347.

B. Maintain one copy of each document on site.

1.07 QUALIFICATIONS

A. Design formwork under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located in the State of Utah.

1.08 REGULATORY REQUIREMENTS

A. Conform to applicable code for design, fabrication, erection and removal of formwork.

1.09 COORDINATION

A. Coordinate work under provisions of GENERAL CONDITIONS.

B. Coordinate this Section with other Sections of work which require attachment of components to formwork.

C. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect/Engineer before proceeding.

PART 2 PRODUCTS

2.01 WOOD FORM MATERIALS

A. Form Materials: At the discretion of the Contractor.

B. Lumber: Pine species; construction grade; with grade stamp clearly visible.

2.02 FORMWORK ACCESSORIES

A. Form Ties: Snap-off type, galvanized] metal, fixed length, free of defects that could leave holes larger than one inch in concrete surface.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, absorb moisture, impair natural bonding, or color characteristics of coating intended for use on concrete.

C. Corners: Filleted wood strip type; 3/4 x 3/4 inch size; maximum possible lengths.

D. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.

3.02 EARTH FORMS

A. Earth forms are not permitted.

3.03 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

D. Align joints and make watertight. Keep form joints to a minimum.

E. Obtain approval before framing openings in structural members which are not indicated on Drawings.

F. Provide fillet strips on external corners.

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are effected by agent. Soak inside surfaces untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.05 FORM CLEANING

A. Clean and remove foreign matter within forms as erection proceeds.

B. Clean formed cavities of debris prior to placing concrete.

C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts or water to clean out forms, unless formwork and concrete construction proceed within heat enclosure. Use compressed air or other means to remove foreign matter.

3.06 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 301.

3.07 FIELD QUALITY CONTROL

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

3.08 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and impose loads.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

4. Rub all exposed concrete.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete.

1.02 RELATED SECTIONS

A. Section 03100 - Concrete Formwork.

B. Section 03300 - Cast-in-Place Concrete.

C. Section 03346 - Concrete Floor Finishing: Reinforcement for concrete floor toppings.

1.03 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ACI 318 - Building Code Requirements For Reinforced Concrete.

C. ACI - American Concrete Institute - Detail Manual.

D. ANSI/ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.

E. ANSI/ASTM A184 - Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.

F. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

G. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

H. CRSI - Concrete Reinforcing Steel Institute Manual of Practice.

I. CRSI - Recommended Practice For Placing Reinforcing Bars.

J. CRSI - Recommended Practice For Placing Bar Supports, Specifications and Nomenclature.

1.04 SUBMITTALS

A. Submit under provisions of GENERAL CONDITIONS.

B. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with ANSI/ASTM A184.

B. Maintain one copy of each document on site.

C. Provide Architect/Engineer with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.

1.06 QUALIFICATIONS

A. Design support of reinforcement under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Utah.

1.07 COORDINATION

A. Coordinate work under provisions of GENERAL CONDITIONS.

B. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars, plain finish. Splices shall be lapped a minimum 30 bar diameters or 1'-6" minimum and 40 bar diameters for foundation dowels to masonry walls.

B. Reinforcing Steel Mat: A615, 60 ksi yield grade; steel bars.

C. Stirrup Steel: ANSI/ASTM A82, plain finish.

D. Welded Steel Wire Fabric: ASTM A185 Plain Type; in coiled rolls and flat mats, see drawings; plain finish.

2.02 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions

2.03 FABRICATION

A. Fabricate concrete reinforcing in accordance with ANSI/ASTM A184.

B. Locate reinforcing splices not indicated on Drawings, at point of minimum stress. Review location of splices with Architect/Engineer.

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

B. Accommodate placement of formed openings.

C. Maintain concrete cover around reinforcing as follows:

Item	Coverage
Walls (exposed to weather or backfill)	1-1/2 inch
Footings and Concrete Formed Against Earth	3 inches
Slabs on Fill	1-1/2 inch

D. Conform to applicable I.B.C. code for concrete cover over reinforcement.

3.02 FIELD QUALITY CONTROL

A. Field review will be performed under provisions of GENERAL CONDITIONS.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cast-in-place concrete foundation footings and walls.

B. Slabs on grade, curbs, aprons, etc.

C. Control, and expansion and contraction joint devices associated with concrete work, including joint sealants.

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Section 03100 - Concrete Formwork: Placement of formwork.

1.03 RELATED SECTIONS

A. Section 03100 - Concrete Formwork: Formwork and accessories.

B. Section 03200 - Concrete Reinforcement.

C. Section 03346 - Concrete Floor Finishing.

1.04 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ACI 302 - Guide for Concrete Floor and Slab Construction.

C. ACI 305R - Hot Weather Concreting.

D. ACI 306R - Cold Weather Concreting.

E. ACI 308 - Standard Practice for Curing Concrete.

F. ACI 3 Building Code Requirements for Reinforced Concrete.

G. ASTM C33 - Concrete Aggregates.

H. ASTM C94 - Ready-Mixed Concrete.

I. ASTM C150 - Portland Cement.

J. ASTM C260 - Air Entraining Admixtures for Concrete.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of GENERAL CONDITIONS.

B. Accurately record actual locations of embedded utilities and components which are concealed from view.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

B. Maintain one copy of each document on site.

C. Acquire cement and aggregate from same source for all work.

D. Conform to ACI 305R when concreting during hot weather.

E. Conform to ACI 306R when concreting during cold weather.

1.07 FIELD SAMPLES

A. Provide under provisions of GENERAL CONDITIONS. Coordinate with Section 03100.

B. Sample Panel: Sufficient size to indicate special treatment or finish required.

C. Accepted sample panel is considered basis of quality for the finished work. Keep sample panel exposed to view for duration of concrete work.

D. Accepted sample may not remain as part of the work.

1.08 COORDINATION

A. Coordinate work under provisions GENERAL CONDITIONS.

B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Type II - Normal manufactured by Portland Cement Co.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: Clean and not detrimental to concrete.

2.02 ACCESSORIES

A. Non-Shrink Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,000 psi in 48 hours.

2.03 JOINT DEVICES AND FILLER MATERIALS

A. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt, 1/2 inch thick; tongue and groove profile; manufactured by Celotex.

B. Construction Joint Devices: Integral galvanized steel; 6 inch thick, formed to tongue and groove profile, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

2.04 CONCRETE MIX

A. Mix and deliver concrete in accordance with ASTM C94, requiring the concrete supplier to provide concrete to specified performance criteria.

B. Select proportions for normal weight concrete in accordance with ACI 301 requiring the concrete supplier to provide concrete to specific minimum water/cement ratio.

C. Provide concrete to the following criteria:

1. Compressive Strength 28 days: Foundations: 3,000 psi; W/C = 0.50; Floor Slabs: 4,000 psi, W/C = 0.45.
2. Slump: 2 to 3 inches.
3. Use 6 bag mix for 3,000 psi and 6-1/2 bag mix for 4,000 psi.
4. Aggregates: 3/4" per C33.
5. Exterior concrete is to be air-entrained with 6-1/2% plus or minus 1-1/2% air per C260.

D. Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.

E. Use calcium chloride only when approved by Architect/Engineer.

F. Use set retarding admixtures during hot weather only when approved by Architect/Engineer.

G. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of GENERAL CONDITIONS.

B. Verify requirements for concrete cover over reinforcement. See drawings.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.02 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

B. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with nonshrink grout.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304, ACI 301 and ACI 318.

B. Notify Architect/Engineer minimum 24 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, formed joint fillers are not disturbed during concrete placement.

D. Install joint fillers, primer and sealant in accordance with manufacturer's instructions.

E. Separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.

F. Extend joint filler from bottom of slab to within 1/4 inch of finished slab surface.

G. Install joint devices in accordance with manufacturer's instructions.

H. Install construction joint device in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

I. Install joint device anchors. Maintain correct position to allow joint cover flush with floor and wall finish.

J. Install joint covers in one piece or longest practical length, when adjacent construction activity is complete.

K. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

L. Place concrete continuously between predetermined expansion, control, and construction joints.

M. Do not interrupt successive placement; do not permit cold joints to occur.

N. Place floor slabs in checkerboard pattern indicated.

O. Screed slabs on grade level, maintaining surface flatness of maximum 1/8 inch in 10 ft and provide slope to floor drains as shown on drawings.

P. Tooled joints in walls are to be 1/2" maximum width and depth.

3.04 CONCRETE FINISHING

A. Provide formed vertical concrete surfaces to be left exposed with smooth rubbed or sand float finish.

B. Finish concrete floor surfaces to requirements of Section 03346.

C. Wood float surfaces which will receive ceramic tile with full bed setting system.

D. Steel trowel surfaces which are scheduled to be exposed.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/8 inch per foot nominal as indicated on Drawings.

F. Broom finish all exterior walks.

3.05 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure floor surfaces in accordance with ACI 308.

D. Spraying: Spray water over floor slab areas and maintain wet for 7 days.

3.06 FIELD QUALITY CONTROL

A. The Owner will employ a testing agency as recommended by the Architect.

B. Provide free access to Work and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm and structural engineer for preview prior to commencement of work.

D. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

E. Three concrete test cylinders will be taken for every 10 cu. yds. of each class of concrete placed. Testing lab shall be selected by Architect. Owner will pay for tests except for retesting when defective concrete is detected.

F. One additional test cylinder will be taken during cold weather concreting, cured on on job site under same conditions as concrete it represents.

G. One slump test will be taken for each set of test cylinders taken.

3.07 PATCHING

A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.

C. Patch imperfections as directed.

3.08 DEFECTIVE CONCRETE

A. Defective Concrete: Pitting, spalling, or cracking concrete or concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Architect/Engineer.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

3.09 SCHEDULE - CONCRETE TYPES AND FINISHES

A. Foundation Walls: 3,000 psi 28 day concrete, form finish with honeycomb filled surface and rubbed exposed surfaces.

B. Concrete Slabs on Grade: 4,000 psi 28 day concrete. Steel and wood trowel finishes depending on floor covering (ceramic tile) or exposed concrete.

3.10 TWO (2) YEAR WRITTEN GUARANTEE

A. Provide two year written guarantee to Owner in form approved by architect to promptly remove and/or repair concrete as directed by architect at contractor's expense. New replacement work to carry similar two-year written guarantee. Guarantee shall start from date of Substantial Completion.

END OF SECTION

SECTION 03346

CONCRETE FLOOR FINISHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finishing slabs on grade.

B. Surface treatment with sealer.

1.02 RELATED SECTIONS

A. Section 03300 - Cast-in-Place Concrete: Prepared concrete floors ready to receive finish.

B. Section 03300 - Cast-in-Place Concrete: Control and formed expansion and contraction joints and joint devices.

1.03 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

1.04 SUBMITTALS

A. Manufacturer's Installation Instructions: Indicate criteria for preparation and application.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products under provisions of GENERAL CONDITIONS.

B. Deliver materials in manufacturer's packaging including application instructions.

PART 2 PRODUCTS

2.01 COMPOUNDS - HARDENERS AND SEALERS

A. Chemical Sealer: Clear Spray type; TK26EUV manufactured by Tri-Kote.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of GENERAL CONDITIONS.

B. Verify that floor surfaces are acceptable to receive the Work of this Section.

3.02 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301.

B. Steel trowel surfaces and broom finish for exterior surfaces which are scheduled to be exposed.

3.03 FLOOR SURFACE TREATMENT

A. Apply sealer in accordance with manufacturer's instructions on scheduled floor surfaces.

3.04 TOLERANCES

A. Maximum Variation of Surface Flatness For Exposed Concrete Floors: 1/16 inch in 10 ft.

END OF SECTION

SECTION 06001

CARPENTRY WORK

PART 1 GENERAL

1.01 WORK INCLUDED

A. Rough carpentry and, finish carpentry work. Refer to Schedule located at the end of this Section.

1.02 RELATED WORK

A. Setting anchorage in stud walls for work of this Section.

B. Job layout and supervision of trades thru project.

C. Section 08712 - Hardware: Supply of door hardware as required for this Section.

D. Section 09900 - Painting: Site finishing of finish carpentry and cabinetwork.

1.03 QUALITY ASSURANCE

A. Rough Carpentry Lumber: Visible grade stamp, of agency certified by National Forest Products Association (NFPA).

1.04 SUBMITTALS

A. Submit shop drawings under provisions of GENERAL CONDITIONS.

B. Indicate millwork and finish items.

C. Submit samples under provisions of GENERAL CONDITIONS of standard colors and patterns of plastic laminate for Architect/Engineers selection.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver shop fabricated carpentry items until site conditions are adequate to receive the work. Protect items from weather while in transit.

B. Store indoors, in ventilated areas with a constant, minimum temperature of 60 degrees F, maximum relative humidity of 25 to 55 percent.

PART 2 PRODUCTS

2.01 ROUGH CARPENTRY MATERIALS

A. Lumber: PS 20; graded in accordance with established Grading rules; maximum moisture content of 6 percent; of following species and grades:
1. Light Framing and Miscellaneous Blocking: Stress group Douglas Fir, Larch; No. 2 grade.

B. Nails, Spikes and Staples: Galvanized for exterior locations, high humidity locations and treated wood; plain finish for other interior locations; size and type to suit application.

C. Bolts, Nuts, Washers, Lags, Pins and Screws: Medium carbon steel; sized to suit application, galvanized for exterior locations, high humidity locations and treated wood; plain finish for other interior locations.

D. Fasteners: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for

anchorage to solid masonry or concrete. Bolts or power activated type for anchorage to steel.

E. Exposed Boards: Provide lumber with 19 percent maximum moisture content and any of the following species and grades:
   1. Species and Grade: Eastern white pine, D Select per NELMA or NLGA rules.
   2. Species and Grade: Western or Idaho white pine, Choice per NLGA or WWPA rules.

F. Fasteners: Size and type indicated. Where miscellaneous carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A153 or of Type 304 stainless steel.
   1. Power-Driven Fasteners: CABO NER-272.

2.02 FINISH CARPENTRY AND CABINETWORK MATERIALS

A. Softwood Lumber: PS 20; graded in accordance with the requirements of AWI; maximum moisture content of 6 percent for interior work and 10 percent for exterior work; of following species and grades:

Item	Species	Quality
Trim, & moldings	Hardwood	Custom (stain grade)

B. Hardwood Door: "A" grade, solid core oak doors (see plans) with 5-year guarantee.

C. Nails: Use common nails; all nailing shall be per 2003 I.B.C.

D. Bolts, Nuts, Washers, Lags, Pins and Screws: Size and type to suit application; galvanized finish in concealed and exposed locations.

PART 3 EXECUTION

3.01 INSTALLATION OF FINISH CARPENTRY ITEMS AND CABINET WORK

A. Fit carpentry to other construction, scribe and cope as required for accurate fit. Correlate locations of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

B. Use purpose designed fixture attachments for mounted components. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.

C. Install wood trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

3.02 SCHEDULE

A. Rough Carpentry Work:
   1. Building layout and supervision.
   2. Non-structural concrete form work.
   3. Framing and furring for wall finishes and stud walls.
   4. Miscellaneous furring and blocking.
   5. Setting and installation of metal doors, windows, wood doors, frames and hardware.

B. Interior Finish Carpentry Work:
   1. Doors, windows, and frames.
   2. Door and window frames.

END OF SECTION

SECTION 06112

FRAMING AND SHEATHING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Interior floor and wall framing and floor sheathing.

1.02 RELATED WORK

A. Section 03300 - Cast-In-Place Concrete: Setting anchors in concrete.

1.03 REFERENCES

A. ALSC - American Lumber Standards Committee: Softwood Lumber Standards.

B. APA - American Plywood Association.

C. AWPA - American Wood Preservers' Association: Book of Standards.

D. NFPA - National Forest Products Association.

E. WCLIB - West Coast Lumber Inspection Bureau: Standard Grading Rules for West Coast Lumber.

F. WWPA - Western Wood Products Association.

1.04 QUALITY ASSURANCE

A. Lumber Grading Agency: Certified by ALSC.

B. Plywood Grading Agency: Certified by APA.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store and protect products under provisions of GENERAL CONDITIONS.

PART 2 PRODUCTS

2.01 LUMBER MATERIALS

A. Lumber Grading Rules: NFPA, WWPA.

B. Non-structural Light Framing: Douglas Fir species, #2 grade, 2" and better size classification, 19 percent maximum moisture content.

2.02 SHEATHING MATERIALS

A. Floor Sheathing: APA Structural I, Grade C-D; sanded, or OSB T & G.

2.03 ACCESSORIES

A. Fasteners: Hot-dipped galvanized steel for exterior, high humidity, and treated wood locations; plain finish elsewhere; size and type to suit condition.

B. Drywall Screws: Bugle head, steel, power driven type length of three times thickness of sheathing.

C. Sheathing to floor joist adhesive.

PART 3 EXECUTION

3.01 FRAMING:

A. Raised wood floor system with stud wall pony walls to existing concrete floor. Use treated wood plates against concrete.

B. Install new interior framed stud walls, 2” x 6” at 16” o.c.

3.02 SHEATHING

A. Secure floor sheathing perpendicular to framing members with ends staggered. Secure sheet edges over firm bearing. Provide solid edge blocking between sheets.

3.02 TOLERANCES

A. Framing Members: 1/4 inch maximum from true position.

END OF SECTION

SECTION 07212

BOARD INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at perimeter walls.

1.02 RELATED SECTIONS

A. Section 09260 - Gypboard systems.

1.03 REFERENCES

A. ASTM C578 - Preformed Cellular Polystyrene Thermal Insulation.

B. FS HH-I-530 - Insulation Board, Thermal, Unfaced, Polyurethane.

1.04 PERFORMANCE REQUIREMENTS

A. Materials of this Section shall provide continuity of thermal barrier at building enclosure elements in conjunction with thermal insulating materials.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS - INSULATION MATERIALS

A. U. S. G.

B. Owens-Corning

C. U. S. Rockwool

D. Substitutions: Under provisions of GENERAL CONDITIONS.

2.02 INSULATION MATERIALS

A. Polystyrene Insulation: ASTM C578, Type III; molded bead type, conforming to the following:

Thermal Resistance	R of 7.5
Thickness	1-1/2 inch thick
Board Size	24 x 96 inch
Compressive Strength	Minimum 10 psi
Water Absorption	In accordance with ANSI/ASTM D2842 2 percent by volume maximum
Edges	Square edges

B. Urethane Insulation: expanded cellular type, conforming to the following:

Thermal Resistance	Aged R of 7.5
Thickness	1-1/2 inch thick
Board Size	24 x 96 inch

Compressive Strength	Minimum 10 psi
Water Absorption	In accordance with ANSI/ASTM D2842 2 percent by volume maximum
Edges	Square edges.
Facing	None

2.03 MANUFACTURERS - ADHESIVES (As recommended)

2.04 ACCESSORIES

A. Tape: Bright aluminum Polyethylene Polyester self- adhering type, mesh reinforced, 2 inch wide.

B. Insulation Fasteners: Impale clip of galvanized steel, to be mechanically fastened to surface to receive board insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of GENERAL CONDITIONS.

B. Verify that substrate, adjacent materials, and insulation boards are dry and ready to receive insulation.

C. Verify substrate surface is flat, free of honeycomb, fins, and irregularities.

3.02 INSTALLATION - EXTERIOR MASONRY WALLS

A. Install boards on inside wall surface, vertically. Place membrane surface of insulation against adhesive. Block in between vertical 'Z' metal furring members and push into adhesive.

B. Place boards in a method to maximize contact bedding. Stagger end joints. Butt edges and ends tight to adjacent board and to protrusions.

3.03 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of GENERAL CONDITIONS.

B. Do not permit Work to be damaged prior to covering insulation.

END OF SECTION

SECTION 07213

BLOWN-IN ATTIC INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Blown-In insulation over existing building attic ceiling.

1.02 REFERENCES

A. ASTM C665 - Mineral Fiber Blown-In Thermal Insulation for Light Frame Construction.

1.03 PERFORMANCE REQUIREMENTS

A. Materials of this Section shall provide continuity of thermal barrier at building enclosure elements in conjunction with thermal insulating materials.

1.04 SUBMITTALS

A. Submit under provisions of GENERAL CONDITIONS.

B. Product Data: Provide data on product characteristics, performance criteria and limitations.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 COORDINATION

A. Coordinate Work under provisions of GENERAL CONDITIONS.

PART 2 PRODUCTS

2.01 MATERIALS

A. Insulation: Blown-In glass fiber attic insulation conforming to the following:
1. Ceiling:
Thermal Resistance Ceiling: R-38 (12")

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of GENERAL CONDITIONS.

B. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.

C. Verify all other work in above ceiling is ready before commencing work.

3.02 INSTALLATION

A. Mechanically blow glass fiber insulation over entire building attic ceiling with uniform layer of 12", with 12" blanket batt attached to attic access door.

B. Installation is not to be installed until all mechanical and electrical work is completed.

END OF SECTION

SECTION 07240

STANDARD STUCCO SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Standard hard coat stucco with colored synthetic finish coating.

1.02 RELATED SECTIONS

A. Section 07900 - Joint Sealers: Perimeter sealant seal.

1.03 PERFORMANCE REQUIREMENTS

A. Materials of this Section shall provide continuity of thermal barrier at building enclosure elements.

1.04 SUBMITTALS

A. Product Data: Provide data on system materials, product characteristics, performance criteria, limitations, and color samples.

B. Samples: Submit two, 10" x 10" size samples illustrating coating color and texture range for selection.

C. Manufacturer's Installation Instructions: Indicate preparation required, installation techniques and jointing requirements.

1.05 QUALIFICATIONS

A. Applicator: Company specializing in performing the work of this Section with minimum three years approved by manufacturer.

1.06 REGULATORY REQUIREMENTS

A. Conform to UL rating for system fire resistance ratings for finish system.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products under provisions of GENERAL CONDITIONS.

B. Protect adhesives and finish materials from freezing by storing in an environment recommended by manufacturer.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not install finish when ambient temperature is below 40 degrees F.

B. Maintain this temperature during and 24 hours after installation of finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Drivit.

B. Other acceptable manufacturers offering equivalent products.

1. Senergy

2.02 MATERIALS

A. 'Tyvek' stucco wrap vapor barrier to be installed prior to base coat stucco and wire reinforcing coat.

B. Scratch or Base Coat With Reinforcement: Stainless steel mesh anchored to sheathing over "Tyvek" wrap.

C. Finish Coating: Synthetic composition, air curing, containing fibers and color as selected.

2.03 ACCESSORIES

A. Fastening: Galvanized metal channel with non-corrosive fasteners.

B. Perimeter Trim and Control Joints: Extruded plastic with attachment flanges.

C. Sealant Materials: Recommended by coating manufacturer. Type, specified in Section 07900.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of GENERAL CONDITIONS.

B. Verify that substrate and adjacent materials are dry.

C. Verify substrate surface is flat, free of irregularities.

3.02 INSTALLATION OF 'TYVEK' AND STAINLESS STEEL MESH REINFORCING

A. Mechanically attach 'Tyvek' house wrap to sheathing using galvanized or stainless steel fasteners.

B. Attach stainless steel reinforcing mesh next using stainless steel fasteners.

C. Lap reinforcement edges and ends 2-1/2 inches.

3.03 INSTALLATION - COATING

A. Install portland cement base coating and reinforcement in accordance with manufacturer's instructions with thickness sufficient to embed mesh plus or minus inch.

B. Install perimeter trim and control joints.

C. Apply finish coating to a minimum thickness of 1/4 inch, with sand finish texture and color approved by Architect.

D. Apply sealant at finish perimeter and control joints in accordance with Section 07900.

3.04 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of GENERAL CONDITIONS.

B. Do not permit finish surface to become soiled or damaged.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparing sealant substrate surfaces.

B. Sealant and backing.

1.02 RELATED SECTIONS

A. Section 07620 - Sheet Metal Flashing: Sealants used in conjunction with metal flashings.

B. Section 08111 - Standard Steel Door and Window Framing: Sealants used in conjunction with door and window frames.

C. Section 08800 - Glazing: Sealants used in conjunction with glazing methods.

1.03 REFERENCES

A. ASTM C790 - Use of Latex Sealing Compounds.

B. FS TT-S-00227 - Sealing Compound: Elastomeric Type, Multi-Component.

1.04 SUBMITTALS

A. Submit product data under provisions of GENERAL CONDITIONS.

B. Submit product data indicating sealant chemical characteristics, performance criteria, limitations, and color availability.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum 3 years documented experience.

B. Conform to Sealant and Waterproofers Institute requirements for materials and installation.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install solvent curing sealants in enclosed building spaces.

B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 SEQUENCING AND SCHEDULING

A. Coordinate the work of this Section with all Sections referencing this Section.

1.08 WARRANTY

A. Provide 3 year warranty.

B. Warranty: Include coverage of installed sealants and accessories which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 SEALANTS

A. Polysulphide Sealant: FS TT-S-00227, Type II - non-sag, Class A; white color; manufactured by Thiokol; color to match surrounding surfaces.

2.02 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: ANSI/ASTM D1056; round, cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and joint openings are ready to receive work and field measurements are as shown on Drawings and recommended by the manufacturer.

B. Beginning of installation means installer accepts existing surfaces.

3.02 PREPARATION

A. Clean and prime joints in accordance with manufacturer's instructions.

B. Remove loose materials and foreign matter which might impair adhesion of sealant.

C. Verify that joint backing and release tapes are compatible with sealant.

D. Perform preparation in accordance with sealant manufacturer's instructions.

E. Protect elements surrounding the work of this Section from damage or disfiguration.

3.03 INSTALLATION

A. Install sealant in accordance with manufacturer's instructions.

B. Measure joint dimensions and size materials to achieve required width/depth ratios.

C. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width.

D. Install bond breaker where joint backing is not used.

E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

G. Tool joints concave.

3.04 CLEANING AND REPAIRING

A. Clean work under provisions of GENERAL CONDITIONS.

B. Clean adjacent soiled surfaces.

C. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of GENERAL CONDITIONS.

B. Protect sealants until cured.

END OF SECTION

SECTION 08111

STANDARD STEEL DOOR AND DOOR FRAMES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Non-rated and fire rated doors and frames for wood doors and hollow metal doors.

2. Non-rated window frames.

1.02 RELATED WORK

A. Section 08712 - Hardware.

B. Section 08800 - Glazing.

C. Section 09900 - Painting: Field painting of door frames.

1.03 REFERENCES

A. ASTM E152 - Methods of Fire Tests of Door Assemblies.

B. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

C. NFPA 80 - Fire Doors and Windows.

D. NFPA 252 - Fire Tests for Door Assemblies.

E. SDI-100 - Standard Steel Doors and Frames.

F. SDI-105 - Recommended Erection Instructions for Steel Frames.

G. UL 10B - Fire Tests of Door Assemblies.

1.04 QUALITY ASSURANCE

A. Conform to requirements of SDI-100.

B. Fire rated door frame construction to conform to ASTM E152, NFPA 252, UL 10B.

C. Installed frame assembly to conform to NFPA 80 for fire rated class indicated in Door Schedule on Drawings.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable construction code for fire rated frames.

1.06 SUBMITTALS

A. Submit shop drawings and product data under provisions of GENERAL CONDITIONS.

B. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.

C. Indicate door elevations, internal reinforcement and closure method.

D. Submit manufacturer's installation instructions under provisions of GENERAL CONDITIONS.

1.07 DELIVERY, STORAGE AND PROTECTION

A. Protect products under provisions of GENERAL CONDITIONS.

B. Protect frames with resilient packaging sealed with heat shrunk plastic.

C. Break seal on-site to permit ventilation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Amweld

B. Republic

C. Kewanee

D. Substitutions: Under provisions of GENERAL CONDITIONS.

2.02 DOORS AND FRAMES

A. Doors: SDI-100 Grade II, heavy duty, 1-3/4", Level B, full flush composite construction

B. Interior Frames: 16 gage Thick material, core thickness. To suit grade and model of door.

2.03 DOOR CORE

A. Core: Impregnated cardboard honeycomb.

2.04 ACCESSORIES

A. Rubber Silencers Resilient rubber.

2.05 PROTECTIVE COATINGS

A. Primer: Zinc chromate baked gray primer type.

2.06 FABRICATION

A. Fabricate frames as welded unit type.

B. Fabricate frames and doors with hardware reinforcement plates welded in place.

C. Prepare frame for silencers. Provide three single rubber silencers for single doors on strike side, and two single silencers on frame head.

D. Attach fire rated label to each frame and door unit called out as label door.

D. Close top edge flush with inverted steel channel closure. Seal joints watertight.

2.07 FINISH

A. Primer: Baked on.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install frames in accordance with SDI-105.

B. Install door in accordance with DHI.

C. Coordinate with masonry, wallboard, and wall construction for anchor placement.

3.02 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.03 ADJUSTING AND CLEANING

A. Adjust hardware for smooth and balanced door movement.

END OF SECTION

SECTION 08410

ALUMINUM ENTRANCE STOREFRONTS AND WINDOWS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Aluminum windows, doors, frames, and glazed lights.

B. Glass.

C. Anchors, brackets, and attachments.

D. Door hardware.

E. Perimeter sealant.

1.02 WORK INSTALLED BUT FURNISHED UNDER OTHER SECTIONS

A. Section 08712 - Hardware: Door hardware items other than specified in this Section.

1.03 RELATED WORK

A. Section 09260 - Gypboard Systems: Preparation of adjacent work to receive work of this Section.

B. Section 06001 - Carpentry Work:

C. Section 07900 - Joint Sealers: Perimeter sealant and back-up materials.

1.04 REFERENCES

A. ANSI/ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products.

B. ANSI/ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.

C. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.

1.05 PERFORMANCE

A. System to provide for expansion and contraction within system components caused by a cycling temperature range of 120 F degrees without causing detrimental effects to system or components.

B. Design and size members to withstand dead loads and live loads caused by pressure and suction of wind as calculated in accordance with I. B. C.

C. Limit mullion deflection to 1/200, or flexure limit of glass with full recovery of glazing materials, whichever is less.

D. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior.

E. Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of assembly surface area, measured at a reference differential pressure across assembly of 0.3 inches water gage as measured in accordance with ANSI/ASTM E283.

F. System to accommodate, without damage to system or components, or deterioration of perimeter seal: Movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; and deflection of structural support framing.

1.06 SUBMITTALS

A. Submit shop drawings and product data under provisions of GENERAL CONDITIONS.

B. Include system and component dimensions; components within assembly; framed opening requirements and tolerances; anchorage and fasteners; glass and infills; door hardware requirements; and affected related work.

C. Submit manufacturer's installation instructions.

D. Submit samples under provisions of GENERAL CONDITIONS.

E. Submit two samples, 3" X 3" in size, illustrating prefinished aluminum surface and specified glass.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver and handle system components under provisions of GENERAL CONDITIONS.

B. Store and protect system components under provisions of GENERAL CONDITIONS.

C. Provide wrapping to protect prefinished aluminum surfaces.

1.08 WARRANTY

A. Provide three year manufacturer's warranty.

B. Warranty: Cover complete system for failure to meet specified requirements.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Kawneer Frame Style - 350 Doors (Bronze)
Kawneer 2” x 3” fixed Window (white aluminum-match existing)

B. Capital Glass 3-1/2" Frame Doors
Capital Glass Window (white aluminum-match existing)

C. Substitutions: Under provisions of GENERAL CONDITIONS.

2.02 MATERIALS

A. Extruded Aluminum: ANSI/ASTM B221; 6063T5 aluminum alloy; storefront to be Bronze finish.

B. Sheet Aluminum: ASTM B209; 6063T5 aluminum alloy;

C. Fasteners: Stainless, Galvanized steel.

2.03 FABRICATED COMPONENTS

A. Frames: 2" x 4-1/2" profile. (Storefront) New windows to match existing.

B. Doors: 2 inches thick, 3-1/2 inch wide top rail, 3-1/2 inch wide vertical stiles, 10 inch wide bottom rail to meet ADA requirements; square glazing stops.

C. Reinforced Mullion: 2 x 4-1/2 inch profile of extruded aluminum cladding with internal reinforcement of steel shaped structural section.

2.04 GLASS AND GLAZING MATERIALS

A. Glass in Exterior Window Lights (either side of Entry Doors/Sidelights and Exterior Windows): 1" Low 'E' insulated tempered plate glass.

B. Glass in Door: Low 'E', insulated tempered glass.

2.05 HARDWARE

A. Weatherstripping, Sill Sweep Strips, Weatherstripping Thresholds, Hinges: Manufacturers' standard type to suit application.

B. Push/Pull: Kawneer 1" Round Style, C09 pull; #CP II push, mill finish.

C. Closer: LCN with cover Dark Bronze.

D. Exit Device: Kawneer #1590 Panic (mill finish). (1) each outside entry door.

E. Cylinder Lock: Outside door #1 is to have a panic exit device with cylinder lock from outside.

2.06 FABRICATION

A. Fabricate doors and frames allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.

B. Rigidly fit and secure joints and corners with internal reinforcement. Make joints and connections flush, hairline, and weatherproof.

C. Develop drainage holes with moisture pattern to exterior.

D. Prepare components to receive anchor devices. Fabricate anchorage items.

E. Arrange fasteners, attachments, and jointing to ensure concealment from view.

F. Prepare components with internal reinforcement for door hardware.

2.07 FINISHES

A. Exterior Extruded Aluminum Surfaces: Fluropon color by Architect.

B. Interior Exposed Aluminum Surfaces: Fluropon color by Architect.

C. Concealed Steel Items: Galvanized in accordance with ANSI/ASTM A386 to 2.0 oz/sq ft. Primed with iron oxide paint.

D. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install doors, frames, glazing and hardware in accordance with manufacturer's instructions.

B. Use anchorage devices to securely attach frame assembly to structure.

C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

D. Coordinate attachment and seal of air and vapor barrier materials. Install sill flashings.

E. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

F. Install hardware using templates provided. Refer to Section 08712 for installation requirements.

G. Install glass in accordance with Section 08800, using exterior dry method of glazing.

H. Install perimeter joint type sealant, backing materials, and installation requirements in accordance with Section 07900.

I. Adjust operating hardware.

3.03 TOLERANCES

A. Variation from Plane: 0.03 inches per foot maximum or 0.25 inches per 30 feet, whichever is less.

B. Misalignment of Two Adjoining Members Abutting in Plane: 0.015 inches.

3.04 CLEANING

A. Remove protective material from prefinished aluminum surfaces.

B. Wash down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08712

DOOR HARDWARE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Hardware for doors.

B. Thresholds.

C. Gasketing.

1.02 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish templates to Section 08111 - Standard Frames for door and frame preparation.

B. Furnish door hardware to Section 06001 - Carpentry Work for installation.

1.03 RELATED WORK

A. Section 06001 - Carpentry Work.

B. Section 08111 - Standard Frames.

1.04 REFERENCES

A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

B. ANSI/NFPA 80 - Fire Doors and Windows.

C. BHMA - Builders' Hardware Manufacturers Association.

D. DHI - Door and Hardware Institute.

E. NFPA 101 - Life Safety Code.

F. SDI - Steel Door Institute.

1.05 COORDINATION

A. Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.

1.06 QUALITY ASSURANCE

A. Manufacturers: Companies specializing in manufacturing door hardware with minimum three years experience.

B. Hardware Supplier: Company specializing in supplying commercial door hardware with three years experience and approved by manufacturer.

C. Hardware Supplier Personnel: Employ a qualified person to assist in the work of this Section.

1.07 REGULATORY REQUIREMENTS

A. Conform to I. B. C. and A. D. A. for requirements.
B. Conform to the applicable sections of Chapter 5 of NFPA 101.

1.08 SUBMITTALS

A. Submit schedule, shop drawings, and product data under provisions of GENERAL CONDITIONS.

B. Indicate locations and mounting heights of each type of hardware to comply with handicapped and State of Utah standards.

C. Provide product data on specified hardware.

D. Submit manufacturer's parts lists, templates, and installation instructions.

1.09 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of GENERAL CONDITIONS.

B. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of GENERAL CONDITIONS.

B. Store and protect products under provisions of GENERAL CONDITIONS.

C. Package hardware items individually; label and identify package with door opening code to match hardware schedule.

D. Deliver keys to Owner by security shipment direct from hardware supplier.

E. Protect hardware from theft by cataloging and storing in secure area.

1.11 WARRANTY

A. Provide five year warranty.

B. Warranty: Include coverage of door closers, locksets, cylinders, and hinges.

1.12 MAINTENANCE MATERIALS

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 PRODUCTS

2.01 ACCEPTABLE SUPPLIERS

A. Arrow

B. Russwin

C. Sargeant

D. Substitutions: Under provisions of GENERAL CONDITIONS and Architect approval (5) working days prior to bidding.

2.02 ACCEPTABLE MANUFACTURERS

A. Hinges: Stanley, Hagar, Arrow.

B. Latch Sets: Arrow, Russwin, Schlage.

C. Push/Pulls: Quality, Arrow, Russwin.

D. Cylinder Locks: Arrow, Russwin, Schlage.

E. Exit Devices: Arrow, Von Duprin, Russwin.

F. Closers: LCN, Arrow, Russwin.

G. Gasketting: Pemko, Stanley, Trimco.

H. Protection Plates: Quality, Arrow, Trimco.

I. Substitutions: Under provisions of GENERAL CONDITIONS and Architect approval (5) working days prior to bidding.

2.03 KEYING

A. Door Locks: Keyed in like-groups and Master keyed to existing building system including construction keying.

B. Supply 2 keys for each lock.

C. Supply keys in the following quantities:
1. 2 master keys.
2. 2 construction keys.

2.04 FINISHES

A. Finishes are identified in Schedule at end of this Section.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions.

B. Use the templates provided by hardware item manufacturer.

C. Mounting heights for hardware from finished floor to center line of hardware item:

1.	Locksets:	40-5/16 inches
2.	Push/Pulls:	45 inches
3.	Dead Locks:	48 inches
4.	Panic Devices:	40-5/16 inches

D. Conform to ANSI A117.1 for positioning requirements for the handicapped.

3.03 SCHEDULE

A. Following groups of finish hardware shall be furnished and installed complete with all plates, screws,

and other accessories to make a complete installation. Numbers specified herein are taken from the following manufacturer's catalogs.

Locks (Lever type)	Russwin, Schlage, Arrow
Hinges	Stanley, Hagar, Arrow
Stops	Glynn Johnson or Quality
Closers	Dorma, LCN, Arrow (set at 5 to 8 lbs. pressure)
Miscellaneous	As called for on Schedule

Hardware of equal quality, function, and finish as manufactured by Arrow, Russwin, or Sargeant will be accepted.

H-1

2 ea. Cylinders as required for panic; balance by door supplier

H-2

Hardware by manufacturer.

H-3

1 ea. Cylinder as required for panic; balance by door supplier.

H-4

Reuse existing hardware; adjust as required.

H-5

1-1/2 pr. Hinges, FBB179, 4-1/2 x 4-1/2, US26D
1 ea. Stop, US26D
1 ea. Lockset, office function, US26D
3 ea. Silencers

H-6

Hinges - existing
1 ea. Lockset, office function, US26D
3 ea. Silencers
1 ea. Stop, US26D

END OF SECTION

SECTION 08800

GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass and glazing for windows, storefront, and hollow metal work.

1.02 RELATED SECTIONS

A. Section 07900 - Joint Sealers: Sealant and back-up material.

B. Section 08111 - Standard Steel Door Frames: Glazed interior aluminum windows.

1.03 REFERENCES

A. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.

B. ASTM C1036 - Flat Glass.

C. FGMA - Glazing Manual.

D. FS TT-G-410 - Glazing Compound, Sash (Metal) for Back Bedding and Face Glazing (Not for Channel or Stop Glazing).

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with FGMA Glazing Manual for glazing installation methods.

B. Wind Velocity = 70 mph Exposure 'B' per I.B.C.

1.05 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on Drawings.

1.06 COORDINATION

A. Coordinate Work under provisions of GENERAL CONDITIONS.

B. Coordinate the Work with glazing frames, wall openings, and perimeter air and vapor seal to adjacent Work.

1.07 WARRANTY

A. Provide five year manufacturer's warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS - FLAT GLASS MATERIALS

A. Libbey-Owens-Ford

B. Pittsburgh

C. Misco

2.02 FLAT GLASS MATERIALS

A. Float Glass (Type FG-A): Clear, insulated, Low "E", 1/4 inch thick, for doors and sidelights for inside Vestibule door #1. (Tempered as required.)

2.03 SEALED INSULATING GLASS MATERIALS

A. Insulated Glass Units (Type SG-A): ASTM E774 and E773; double pane with silicone sealant edge seal; outer pane of Low E clear glass, inner pane of clear glass, interpane space purged dry air; total unit thickness of 1" minimum for exterior Door #1 and exterior windows. (Tempered as required.)

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80-90 Shore A durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 - 60 Shore A durometer hardness, minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device]; 10 - 15 Shore A durometer hardness; coiled on release paper; black color.

D. Glazing Splines: Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot; black color.

E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify prepared openings.

B. Verify that openings for glazing are correctly sized and within tolerance.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

3.03 INTERIOR - DRY METHOD (TAPE AND TAPE)

A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.

B. Place setting blocks at 1/3 points with edge block no more than 6 inches from corners.

C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

D. Place glazing tape on free perimeter of glazing in same manner described above.

E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

F. Knife trim protruding tape.

3.04 QUALITY CONTROL

A. Field inspection will be performed under provisions of GENERAL CONDITIONS.

B. Inspection will monitor quality of glazing.

3.05 CLEANING

A. Clean work under provisions of GENERAL CONDITIONS.

B. Remove glazing materials from finish surfaces.

C. Remove labels after work is complete.

D. Clean glass and mirrors.

3.06 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of GENERAL CONDITIONS.

B. After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

SECTION 09260

GYPSUM BOARD SYSTEMS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Stud wall framing.

B. Gypsum board.

C. Taped and sanded joint treatment.

1.02 RELATED WORK

A. Section 06112 - Framing and Sheathing

B. Section 07213 - Batt and Blanket Insulation: Thermal insulation.

C. Section 08111 - Standard Steel Door Frames.

D. Section 09900 - Painting: Surface finish.

1.03 REFERENCES

A. ANSI/ASTM C36 - Gypsum Wallboard.

B. ANSI/ASTM C475 - Joint Treatment Materials for Gypsum Wallboard Construction.

C. ANSI/ASTM C754 - Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.

D. GA-201 - Gypsum Board for Walls and Ceilings.

E. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

1.04 QUALITY ASSURANCE

A. Applicator: Company specializing in gypsum board systems work with three years experience.

1.05 REGULATORY REQUIREMENTS

A. Conform to local City code for fire rated assemblies.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - GYPSUM BOARD SYSTEM

A. U. S. Gypsum Co.

B. Other acceptable manufacturers offering equivalent products:
1. Georgia Pacific.
2. National Gypsum.

C. Substitutions: Under provisions of GENERAL CONDITIONS.

2.02 FRAMING MATERIALS

A. Studs: Load bearing, wood; structural grade. See Section 0600.

B. Fasteners: ANSI/ASTM C646.

2.03 GYPSUM BOARD MATERIALS

A. Standard Gypsum Board: ANSI/ASTM C36; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.

B. Fire Rated Gypsum Board: ANSI/ASTM C36; fire resistive type, UL rated; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges. Ceilings and walls down to top of ceramic tile.

2.04 ACCESSORIES

A. Corner Beads: Metal.

B. Edge Trim: GA 201 and GA 216 bead.

C. Joint Materials: ANSI/ASTM C475; reinforcing tape, joint compound, adhesive, water, and fasteners.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that site conditions are ready to receive work and opening dimensions are as indicated on drawings.

B. Beginning of installation means acceptance of existing surfaces and substrate.

3.02 METAL STUD INSTALLATION (Option for non-load bearing only)

A. Install studding in accordance with ANSI/ASTM C754.

B. Stud Spacing: 16 inches on center.

C. Partition Heights: Varies above finished floors.

D. Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.

E. Blocking: Bolt or screw steel channels to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, and hardware. Wood is to be fire treated.

F. Coordinate installation of bucks, anchors, blocking, electrical and mechanical work placed in or behind partition framing.

3.03 CEILING FRAMING INSTALLATION

A. Install in accordance with ANSI/ASTM C754.

B. Coordinate location of hangers with other work.

C. Install ceiling framing dependent bearing on walls, columns, and above-ceiling work.

D. Reinforce openings in ceiling system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.

3.04 GYPSUM BOARD INSTALLATION

A. Install gypsum board in accordance with manufacturer's instructions.

B. Erect single layer fire rated gypsum board horizontally (long dimension at right angles to framing members) with edges and ends occurring over firm bearing on both walls and ceilings.

C. Use screws when fastening gypsum board to metal furring or ceiling framing and metal studs.

D. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abutts dissimilar materials as indicated.

3.05 JOINT TREATMENT

A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

B. Feather coats onto adjoining surfaces so that camber is maximum 1/16 inch.

C. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile.

3.06 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09511

SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Suspended metal grid ceiling system and seismic bracing.

B. Acoustical tile.

C. Non-fire rated assembly.

D. Perimeter trim.

1.02 RELATED WORK

A. Section 15800 - Air Handling: Air diffusion devices in ceiling system.

B. Section 16100 - Electrical: Basic Materials and Methods: Light fixtures in ceiling system.

1.03 REFERENCES

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

B. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacture of ceiling suspension system and ceiling tile with three years minimum experience.

B. Installer: Company with three years minimum experience.

1.05 REGULATORY REQUIREMENTS

A. Conform to Uniform Building Code for suspension, materials, and seismic bracing requirements.

1.06 SUBMITTALS

A. Submit product data under provisions of GENERAL CONDITIONS.

B. Provide product data on metal grid system components, acoustic units, and ratings.

C. Submit samples under provisions of GENERAL CONDITIONS.

D. Submit two samples 12" x 12" in size, illustrating material and finish of acoustic units.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F and humidity of 20 to 40 percent prior to, during, and after installation.

1.08 SEQUENCING/SCHEDULING

A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Schedule installation of acoustic units after interior wet work is dry.

1.09 EXTRA STOCK

A. Provide (2) boxes or cartons of extra acoustic units to Owner at completion.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - SUSPENSION SYSTEM

A. Armstrong.

B. U. S. Gypsum.

C. Donn.

D. Substitutions: Under provisions of GENERAL CONDITIONS.

2.02 SUSPENSION SYSTEM MATERIALS

A. Grid: ASTM C635, intermediate duty, non-fire rated exposed T, white; components die cut and interlocking.

B. Accessories: Stabilizer bars, clips, splices and edge moldings required for suspended grid system and seismic bracing requirements.

C. Grid Materials: Commercial quality cold rolled steel with galvanized coating.

D. Grid Finish: White face.

E. Support Channels and Hangers: Galvanized steel; size and type to suit application, to rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

2.03 ACCEPTABLE MANUFACTURERS - ACOUSTIC UNITS

A. U. S. Gypsum Style: Non-directional, Glacier - Tegular Panels

B. Substitutions: Under provisions of GENERAL CONDITIONS.

C. Acoustic Materials:
1. Size: 24 x 48 inches. (See plans)
2. Thickness: 5/8 inches.
3. Composition: Mineral.
4. Density: 1.02 lb/cu ft.
5. Light Reflectance: LR-1 percent.
6. NRC Range: .60 to .70.
7. STC Range: 25 to 29.
8. Edge: Tegular.
9. Surface Color: White.
10. Surface Finish: Non-directional, Glacier

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that existing conditions are ready to receive work.

B. Verify that layout of hangers will not interfere with other work.

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install system in accordance with ASTM C636, manufacturer's instructions, as supplemented in this Section, and I. B. C. for seismic Zone #3.

B. Install system capable of supporting imposed loads to a deflection of 1/360 maximum.

C. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

D. Hang system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

F. Locate system on room axis according to reflected plan.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

H. Do not eccentrically load system, or produce rotation of runners.

I. Install edge molding at intersection of ceiling and vertical surfaces and rout edge to set down into recess, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions. See detail on drawings for seismic requirements.

J. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.

K. Install acoustic units level, in uniform plane, and free from twist, warp and dents.

3.03 TOLERANCES

A. Variation from Flat and Level Surface: 1/8 inch in 10 ft.

B. Variation from Plumb of Grid Members Caused by Eccentric Loads: Two degrees maximum.

END OF SECTION

SECTION 09650

RESILIENT FLOORING & RUBBER BASE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

1.02 RELATED SECTIONS

A. Section 03346 - Concrete Floor Finish: Floor substrate surface.

2. Section 06100 - Carpentry: Wood framing.

1.03 REFERENCES

A. ASTM E84 - Surface Burning Characteristics of Building Materials.

B. FS L-F-475 - Floor Covering, Vinyl Surface (Tile), with Backing.

C. FS SS-T-312 - Tile, Floor: Vinyl Composition.

D. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.04 REGULATORY REQUIREMENTS

A. Conform to State and I. B. C. for flame/ fuel/smoke rating requirements.

1.05 SUBMITTALS

A. Submit shop drawings and product data under provisions of GENERAL CONDITIONS.

B. Provide product data on specified products, describing physical and performance characteristics, sizes, patterns and colors available.

C. Submit samples under provisions of GENERAL CONDITIONS.

D. Submit two samples 3 x 3 inches in size, illustrating color and pattern for each floor material specified.

E. Submit two 4-inch long samples of base material for each color specified.

F. Submit manufacturer's installation instructions.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit cleaning and maintenance data under provisions of GENERAL CONDITIONS.

B. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature

stability.

B. Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

1.08 EXTRA MATERIALS

A. Provide 10 sq ft of flooring and 8 lineal feet of base of each material specified.

PART 2 PRODUCTS

2.01 MANUFACTURERS - TILE FLOORING

A. Armstrong.

B. Azrock.

C. GAF.

D. Substitutions: Under provisions of GENERAL CONDITIONS.

2.02 TILE FLOORING MATERIALS

A. Vinyl Composition Tile: FS SS-T-312, Type IV, Composition 1; 12 x 12 inch, 1/8 inch thick; marbleized design.

2.03 ACCEPTABLE MANUFACTURERS - BASE MATERIALS

A. Flexcove.

B. Azrock.

C. Armstrong.

D. Substitutions: Under provisions of GENERAL CONDITIONS.

2.04 BASE MATERIALS

A. Base: FS SS-W-40, Type I rubber or Type 2 vinyl 4 inch high; 1/8 inch thick; top set coved and toeless; premolded external corners. NOTE: Coved for VC tile and toeless for carpet.

B. Base Accessories: Premolded end stops and external corners, of same material, size, and color as base.

2.05 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Edge Strips: Flooring material.

D. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft, and are ready to receive Work.

B. Verify concrete floors are dry to a maximum moisture content of 7 percent, and exhibit negative alkalinity, carbonization, or dusting.

C. Beginning of installation means acceptance of existing substrate and site conditions.

3.02 PREPARATION

A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

B. Apply, trowel, and float filler to leave a smooth, flat, hard surface.

C. Prohibit traffic from area until filler is cured.

D. Vacuum clean substrate.

E. Apply primer where necessary.

3.03 INSTALLATION - TILE MATERIAL

A. Install in accordance with manufacturers' instructions.

B. Mix tile from container to ensure shade variations are consistent.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Set flooring in place, press with heavy roller to attain full adhesion.

E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile patterns.

F. Install tile to square grid pattern with all joints aligned, with pattern grain alternating with adjacent unit to produce basket weave pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

G. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

H. Install edge strips at unprotected or exposed edges, and where flooring terminates.

I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 INSTALLATION - BASE MATERIAL

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. At exposed ends use premolded units.

C. Install base on solid backing. Bond tight to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.05 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean, seal, and wax floor and base surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09688

CARPET-GLUE DOWN

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpeting glue down method.

1.02 REFERENCES

A. ANSI/ASTM E648 - Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

B. ASTM E84 - Surface Burning Characteristics of Building Materials.

C. FS DDD-C-95 - Carpets and Rugs, Wool, Nylon, Acrylic, Modacrylic.

D. FS DDD-C-0095 - Carpet and Rugs, Wool, Nylon, Acrylic, Modacrylic, Polyester, Polypropylene.

E. FS DDD-C-1559 - Carpet, Loop, Low Pile Height, High Density, Woven or Tufted with Attached Cushioning.

1.03 SUBMITTALS

A. Submit shop drawings and product data under provisions of GENERAL CONDITIONS.

B. Indicate seaming plan, method of joining seams, direction of carpet.

C. Provide product data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

D. Submit samples under provisions of GENERAL CONDITIONS.

E. Submit two samples 12 x 12 inch in size illustrating color and pattern for each carpet material specified.

F. Submit manufacturer’s installation instructions under provisions of GENERAL CONDITIONS.

1.04 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of GENERAL CONDITIONS.

B. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning and shampooing.

1.05 QUALITY ASSURANCE

A. Manufacturer: State contract carpet (Wall 2 Wall, locate contractor/supplier) specializing in tufted carpet.

B. Installer: Wall 2 Wall, Salt Lake City, Utah (801-288-2694).

1.06 REGULATORY REQUIREMENTS

A. Conform to IBC code for carpet flamability requirements.

B. Conform to ANSI/ASTM E648.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain minimum 70 degrees F. ambient temperature three days prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Biglow (New Basics 26) Broadloom.

2.02 MATERIALS

A. Carpet: Type Olefin, Class Tufted.
   1. Gauge -1/10
   2. Pile Weight - 26.0 oz.
   3. Pile Thickness - 137 in.
   4. Solution dyed.

B. Tufted Carpet: Conforming to Utah State contract carpet criteria.

2.03 ACCESSORIES

A. Sub-floor Filler: White premix latex; type recommended by carpet manufacturer.

B. Primers and Adhesives: Waterproof; of types recommended by carpet manufacturer.

C. Edge Strips: Metal type, aluminum finish.

D. Base Gripper: As recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet and are ready to receive work.

B. Verify concrete floors are dry to a maximum moisture content of 7 percent and exhibit negative alkalinity, carbonization, or dusting.

C. Beginning of installation means acceptance of existing substrate and site conditions.

3.02 PREPARATION

A. Remove floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.

B. Apply, trowel, and float filler to leave smooth, flat, hard surface.

C. Prohibit traffic until filler is cured.

D. Vacuum floor surface.

3.03 INSTALLATION

A. Apply carpet and adhesive in accordance with manufacturer’s instructions.

B. Lay out rolls of carpet for approval.

C. Verify carpet match before cutting to ensure minimal variation between dye lots.

D. Double cut carpet to allow intended seam and pattern match. Make cuts straight, true, and unfrayed. Edge seam carpet at all areas.

E. Locate seams in area of least traffic.

F. Fit seams straight, not crowded or peaked, free of gaps.

G. Lay carpet on floors with run of pile in same direction as anticipated traffic.

H. Do not change run of pile in any room where carpet is continuous through a wall opening into another room. Locate change of color or pattern between rooms under door centerline.

I. Cut and fit carpet around interruptions.

J. Fit carpet tight to intersection with vertical surfaces without gaps.

3.04 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean and vacuum carpet surfaces.

3.05 PROTECTION

A. Prohibit traffic from carpet areas for 24 hours after installation.

END OF SECTION

SECTION 09900

PAINTING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Surface preparation.

B. Surface finish schedule.

C. Color selection schedule furnished by Architect or Owner.

D. Pavement markings.

1.02 RELATED WORK

A. Section 05120 - Structural Steel and 08111 - Standard Steel Doors and Frames: Shop primed items.

B. Section 15600 - Heating and Air Conditioning: Prefinished mechanical equipment.

1.03 REFERENCES

A. ANSI/ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

B. ASTM D2016 - Test Method for Moisture Content of Wood.

1.04 DEFINITIONS

A. Conform to ANSI/ASTM D16 for interpretation of terms used in this Section.

1.05 QUALITY ASSURANCE

A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with three years experience.

B. Applicator: Company specializing in commercial painting and finishing with three years experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to local code for flame/fuel/smoke rating requirements for finishes.

1.07 SUBMITTALS

A. Submit product data under provisions of GENERAL CONDITIONS.

B. Provide product data on all finishing products.

C. Submit samples for color and product approval prior to commencing work.

D. Submit two samples 2 X 2 inch in size illustrating range of colors available for each surface finishing product scheduled, for selection.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of GENERAL CONDITIONS.

B. Store and protect products under provisions of GENERAL CONDITIONS.

C. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.

D. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.

E. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in well ventilated area, unless required otherwise by manufacturer's instructions.

F. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

D. Minimum Application Temperature for Varnish and Enamel Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.10 EXTRA STOCK

A. Provide a one gallon container of each color to Owner.

B. Label each container with color, and room locations, in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - PAINT & VARNISH

A. Kwal-Howell Product: Latex and Enamel

B. Pratt & Lambert Product: Latex and Enamel

C. Benjamin Moore Product: Latex and Enamel

D. Substitutions: Under provisions of GENERAL CONDITIONS.

2.02 ACCEPTABLE MANUFACTURERS - PRIMER-SEALERS

A. Same as Paint Manufacturers

2.03 MATERIALS

A. Coatings: Ready mix all paint items. Process pigments to a soft paste consistancy, capable of being readily and uniformly dispersed to a homogeneous coating.

B. Coatings: Good flow and brushing properties; capable of drying or curing free of streaks or sags.

C. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.04 FINISHES

A. Refer to schedule at end of Section for surface finish and color schedule on Drawings.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that surfaces and substrate conditions are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Gypsum Wallboard: 12 percent.
2. Concrete: 12 percent.
3. Interior Located Wood: 15 percent, measured in accordance with ASTM D2016.
4. Concrete Floors: 12 percent.

D. Beginning of installation means acceptance of existing surfaces and substrate.

3.02 PREPARATION

A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.

B. Correct minor defects and clean surfaces which affect work of this Section.

C. Shellac and seal marks which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Concrete Floors: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

F. Gypsum Board Surfaces: Latex fill minor defects. Spot prime defects after repair.

G. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

H. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

I. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

J. Interior Wood Items Scheduled to Receive Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.

K. Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

3.03 PROTECTION

A. Protect elements surrounding the work of this Section from damage or disfiguration.

B. Repair damage to other surfaces caused by work of this Section.

C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

D. Remove empty paint containers from site daily.

3.04 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceeding coat unless otherwise approved.

E. Sand lightly between coats to achieve required finish.

F. Allow applied coat to dry before next coat is applied.

G. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

H. Prime back surfaces of interior and exteriior woodwork with primer paints.

I. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with glass varnish reduced 25 percent with mineral spirits.

3.05 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Paint shop primed equipment.

B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

C. Replace identification markings on mechanical or electrical equipment when painted accidently.

D. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

E. Color code equipment, piping, conduit, and exposed ductwork in accordance with requirements indicated.

F. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.

3.06 CLEANING

A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.

B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.07 SCHEDULE - SHOP PRIMED ITEMS FOR SITE FINISHING

A. Metal Fabrications (Section 05500): Exposed surfaces of steel lintels, etc.

3.08 SCHEDULE - EXTERIOR SURFACES

A. Steel - Shop Primed
   1. Touch-up with zinc chromate primer.
   2. Two coats alkyd enamel, semi-gloss.

3.09 SCHEDULE - INTERIOR SURFACES

A. Wood - Painted
   1. One coat alkyd prime sealer.
   2. Two coats alkyd enamel, eggshell.

B. Wood - Transparent (match existing wood doors)
   1. Filler coat for open grained wood only.
   2. One coat stain.
   3. Two coats varnish, flat sheen.

C. Steel - Primed
   1. Touch-up with original primer.
   2. Two coats alkyd enamel, semi-gloss.

D. New Gypsum Board
   1. One coat acrylic primer sealer.
   2. Two coats acrylic enamel, eggshell.

3.10 SCHEDULE - COLORS

A. To be scheduled by Architect at a later date.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15010 GENERAL REQUIREMENTS

1.01 GENERAL AND SPECIAL CONDITIONS

The General and Special conditions are hereby made a part of this Division.

1.02 SCOPE

This work consists of, but is not limited to, the furnishing of all plant, labor, materials and equipment in connection with the installation of a complete plumbing system as shown on the drawings, herein specified, or both as follows:

General Mechanical Requirements - Section 15010
Mechanical Insulation - Section 15250
Seismic and Vibration Control - Section 15280
Heating & Air Conditioning - Section 15600

1.03 DRAWINGS AND SPECIFICATIONS

The plans and specifications are to be taken as an integral unit and items called for on one and not the other shall be furnished and installed as though shown and called for in both.

1.04 ORDINANCES AND CODES

The work shall be installed in accordance with the Local, State and any other government code or ordinance that governs the type of work covered by these specifications. Work shall be in accordance with "Uniform Plumbing Code", "Uniform Mechanical Code" and U.L..

1.05 FEES AND PERMITS

This contractor shall obtain all necessary permits and pay for all fees required in connection with his work.

1.06 WORKMANSHIP

Workmanship shall be the best quality of its kind for the respective industries, trades, crafts and practices and shall be acceptable in every respect to the Architect. Nothing contained herein shall relieve the Contractor from making good and perfect work in all details of the construction.

1.07 SUBSTITUTIONS

The procedure for request and approval of substitute materials, as outlined in the General Conditions, shall be strictly adhered to.

1.08 SCHEDULES OF MATERIAL AND EQUIPMENT

As soon as practicable, and within thirty (30) days after date of award of Contract and before commencement of work, a complete schedule of equipment and materials proposed for installation shall be submitted to the Architect by the Contractor for the Architect's approval or rejection. The schedules shall include catalogs, cuts, drawings and such other descriptive data or samples that are requested by the Architect. Five copies shall be submitted.

1.09 REMOVAL OF DEBRIS

Upon completion of this Division of work, remove all surplus materials and rubbish. Clean all spots resulting from this work from hardware, floors, glass, walls, etc. Do all required patching, repair all work of other trades damaged by this division of work and leave the premises in a clean, orderly condition.

1.10 UNDERGROUND WORK

The Contractor shall perform all excavating and backfilling necessary in the construction of ductwork, water and sewer lines. Backfilling and compacting shall be performed as outlined in Division 2. All pipes and fitting laid in trenches after backfilling is done shall be graded on the premises as directed.

1.11 CUTTING AND PATCHING

Any cutting, patching or filling necessary for the proper execution of this work shall be done by the Contractor. Where holes or recesses must be cut in walls, floors or ceilings, or any other part of the building, it shall be done by a competent workman in a neat and workmanlike manner. No rough or unsightly work will be allowed and cutting of the structural members shall be done only on approval of the Architect.

1.12 PIPE SLEEVES AND COLLARS

All pipes passing through floors, beams or wall are to be fitted with galvanized iron sleeves two (2) sizes larger than pipe passing through them. These sleeves are to be cast in the concrete or brick unless openings have been provided in precast concrete members.

1.13 FLOOR AND WALL PLATES

Where uninsulated pipes pass through floor, ceilings or partitions in the finished part of the building, chromium plates shall be provided on all pipe work.

1.14 PIPE LOCATION, ARRANGEMENT AND INSTALLATION

All piping throughout the building is to be arranged to permit free expansion and contraction without injury to pipe or connections.

All pipe shall be reamed at the ends and free of all inside scale or burrs.

Threads shall be cut clean and sharp and to a length equal to one and one-eight (1-1/8) the length of the female thread receiving the pipe. The pipe shall be screwed in the full length of the female thread.

Pipe shall be made tight with thread lubricant worked into male thread only. Surplus material shall be wiped off and the joint left neat and clean. Lubricant shall be powdered graphite and linseed oil or plumbago and linseed oil.

All suspended piping shall be securely supported from the floor to ceiling at not more than ten foot (10') centers for two inches (2) and above and six foot (6') centers for one and one half inches (1-1/2") and below.

Hangers shall be malleable iron split ring adjustable type suspended by wrought iron rods proportional to the size of the pipe. Rods shall be suspended from the concrete inserts designed to set in place on the forms for concrete or form joints. Plumber's tape, chain or wire will not be permitted.

1.15 VALVES

The valves are to be installed with stem above the horizontal unless otherwise shown.

Unless otherwise shown, all valves are to be globe valves.

Valves shall be Jenkins, Crane or Walworth.

Access panels shall be provided for all valves, etc., where necessary to perform necessary repair or adjustments. Size shall be as required to perform work.

1.16 FLASHING

All pipes passing through the roof shall be neatly flashed and counter-flashed with water tight #4 pound sheet lead or sixteen (16) ounce copper flashing, fitting snugly around the pipes and secured to pipe with mechanical pipe clamp. The flange around the base shall be at least sixteen inches (16) square.

1.17 ELECTRICAL WIRING

This Contractor is to furnish and set all motors that pertain to this division of the specifications, but all power wiring and disconnects will be furnished and installed by the Electrical Contractor.

Exceptions for furnishing of starters by the Electrical Contractor will be in those pieces of equipment where the starter is incorporated into package units. See individual equipment descriptions in specifications for those exceptions.

1.18 TESTS AND ADJUSTMENTS

Upon the completion of the job, make all necessary adjustments to the system

Following these adjustments, run tests as in actual services, of at least eight (8) hours duration during which all systems equipment shall function properly and to the satisfaction of the Owner.

Before any piping is covered, tests shall be made in presence of the Architect and any leaks or defective work corrected. No caulking or threaded work will be permitted. Waste and vent system shall be filled to the roof level with water and show no leaks for a period of one (1) hour. Like wise, the water supply system shall be subjected to the 100 psi pressure for four (4) hours and shall show no leaks.

The Contractor shall remove all stains or grease marks on walls, or elsewhere, caused by his workman or for which he is responsible. He shall also remove all stickers on fixtures, adjust all flush valves, pressure reducing valves, etc., and shall leave the premises in first class order.

1.19 GREASING AND OILING

Prior to placing the equipment in operation, the bearings on all motors, etc., shall be properly lubricated with a lubricant suitable for the service.

If the instructions are on bearings or equipment, the lubricant specified shall be used and instructions left on the equipment for the Owner's future use.

1.20 PAINTING

All equipment furnished in finished painted condition by the Contractor shall be left without mark or scratch. Any necessary refinishing to match original shall be done. Do not paint over name plates, motors or serial numbers.

1.21 OPERATING INSTRUCTIONS AND CATALOG INFORMATION

The Contractor shall provide to Owner two copies of complete operating and maintenance instructions. A blueprint showing the operations of the control system shall be included in the above.

The Contractor shall compile in a loose leaf binder a catalog of every product used by him in the completion of the Contract, including all valves and specialties. At the completion of the work and before final acceptance by the Architect, he shall turn over to the Owner this compilation of catalog data. A double index shall be provided, one giving an alphabetical list of products for which catalogs are included and one giving and alphabetical list of all manufacturer's representatives, together with their addresses, whose products are included in the work.

1.22 GUARANTEE

The Contractor shall guarantee the system for a period of one (1) year from date of final acceptance.

Make, free of charge, any repairs necessary due to defective workmanship or materials that may show during a period of one (1) year.

The Contractor's system shall be free from all noise in operation that may develop as the result of failure to construct the system in a workmanlike manner and in strict accordance with the drawings and these specifications.

SECTION 15250 - MECHANICAL INSULATION

PART 1 GENERAL

1.01 SUPPLEMENTAL

The General Provisions of the Contract, including General and Supplementary Conditions and the General Requirements apply to the work specified in this section.

Requirements of Section 15010 apply to this section.

1.02 SCOPE OF WORK

The work shall include all labor, materials, equipment, accessories, transportation and services included in installing the mechanical insulation as outlined below.

Pipe insulation
Duct insulation

1.03 QUALIFICATION OF WORKMAN

Contractor shall use sufficient insulators and supervisors in the execution of this portion of the work to insure the proper and adequate installation of the insulation throughout the work.

1.04 COMPLIANCE WITH SPECIFICATIONS

Whenever required by the Architect or Engineer during the progress of the work, the Contractor shall furnish proof that the insulation installed equals or exceeds all requirements of the specifications.

1.05 FIRE HAZARD CLASSIFICATIONS

Pipe and duct insulation shall be tested in accordance with the requirements of U.L. "pipe and Equipment Covering R5583 400 8.15" and ASTM E-84 Steiner Tunnel Test.

Maximum fire hazard classification of the composite insulation construction as installed shall be not less than:

Flame spread:	25
Fuel Contribution:	50
Smoke Development:	50

PART 2 PRODUCT

2.01 MATERIAL

The insulation products used on each system shall be of one manufacturer, unless specifically excepted. All insulation methods and material shall be compatible with the manufacturer's recommendations.

Approved Manufacturer: Owens-Corning Fiberglass, Johns Mansville, Certain-Teed, or prior approved equal

2.02 PIPE INSULATION

Refrigerant Suction Lines:

All refrigerant suction lines shall be insulated with 1/2" Armaflex insulation with two coats of Armaflex 22 covering.

2.03 SUPPLY DUCTS

All supply ducts shall be wrapped with 1" thick fiberglass duct wrap with factory applied vapor barrier. All joints shall be sealed with mastic and taped to form a neat and complete insulation system.

PART 3 EXECUTION

3.01 INSULATION

Prior to application of insulation of insulating material, surfaces to be insulated shall be clean and dry.

Insulation shall be installed to facilitate removal for making repairs. Insulation sections or blocks shall be placed so the least possible damage to insulation will result from inspection or repair of piping or equipment to which it is applied.

All joints shall be firmly butted together. Longitudinal laps shall be sealed with lap adhesive or vapor seal mastic. Butt joints shall be wrapped with 4" strip or pressure sensitive coated joint sealing strips.

A protective hanger saddle shall be provided at each pipe support or hanger.

Every effort shall be made to make the vapor barrier continuous.

Insofar as possible, pipe insulation shall be applied in sectional form.

All fitting and valves shall be insulated including elbows, tees, flanges, reducers, caps, hubs, traps, and grooved couplings.

All exposed ends of fiberglass insulation shall be coated with an approved material and made water tight.

Unions shall not be insulated.

All penetrations through fire separations shall be caulked with 3M "Fire Barrier".

3.02 TESTING AND APPROVAL

No pipe insulation shall be applied until the piping has been pressure tested and approved. All insulation shall be applied strictly in accordance with manufacturer's recommendations.

DIVISION 15 - MECHANICAL

SECTION 15280 - SEISMIC AND VIBRATION CONTROL

1.01 GENERAL CONDITIONS:

All pertinent sections of Section 15010, Division 15, are a part of the work described in this section. Division 1 is a part of this and all other sections of these specifications.

1.02 SCOPE OF WORK:

The scope of work shall include all labor, material, and equipment necessary for a complete anchorage and seismic restraint system and vibration isolation system for all work included as part of Division 15. The system design and installation shall be based on Seismic requirements for I.B.C., and other standards listed below.

The work shall include all mechanical isolated and non-isolated equipment, ducts and piping systems which shall include:

1. Ceiling and roof fans
2. Rectangular ductwork 6 sq. ft. in cross-sectioned area and larger
3. All piping 2 1/2" diameter and larger except waste, vent and roof drainage piping

1.03 REFERENCE STANDARDS:

1. International Building Code
2. NFPA Bulletin 90A
3. UL Standard 181
4. Tri-Services Manual, Fagel Et Al, 1973
5. SMACNA Guidelines for Seismic Restraints of Mechanical Systems
6. ASHRAE - American Society of Heating, Ventilating and Air Conditioning Engineers

1.04 RELATED WORK:

Refer to Section 15600 for equipment to be furnished for seismic restraints as part of this section.

1.05 SUBMITTALS:

Submit product data in accordance with Division 1 and Section 15010. Submit the following:

Restraint system and anchorage method to be used for each piece of equipment.

Shop drawings showing size, hanger length, and the location of all seismic restraints for piping and ductwork.

Seismic restraints and calculations for all flexible mounted equipment.

Vibration isolators and flexible couplings.

Details for all the isolators and seismic bracing with snubbers proposed for items in this specification and on the Drawings.

Details for steel frames, concrete inertia bases, and anchors to be used in conjunction with the isolation of the items in this specification and drawings.

Clearly outlined procedures for installing and adjusting the isolators, seismic bracing anchors and snubbers.

1.06 SEISMIC REQUIREMENTS AND QUALIFICATIONS:

The Mechanical Contractor shall be responsible for supplying and installing equipment, vibration isolators, flexible connections, rigid steel frames, anchors, inserts, hangers and attachments, supports, seismic snubbers and bracing to comply with the Uniform Building Code.

All supports, hangers, bases, braces and anchorage for all non-isolated equipment, ductwork and piping shall be installed as detailed and specified in the contract documents. Specific requirements on equipment anchorage and restraints, locations and sizes shall be furnished by the contractor and submitted to the Project Engineer for review after shop drawings for mechanical equipment have been reviewed.

All supports, hangers, bases, anchorage and bracing for all isolated equipment shall be designed by a professional engineer employed by the restraint manufacturer, qualified with seismic experience in bracing for mechanical equipment. Shop drawings submitted for earthquake bracing and anchors shall bear the Engineer's signed professional seal.

The Contractor shall require all equipment suppliers to furnish equipment that meets the seismic code, with bases designed to receive seismic bracing and/or anchorage. All isolated mechanical equipment bracing to be used in the project shall be designed from the Equipment Shop Drawings certified correct by the equipment manufacturer for Seismic Zone III.

Manufacturers and suppliers of restraint equipment and systems approved for use by the Contractor, for isolated and non-isolated systems, are Mason Industries, Inc., Korfund, Amber/Booth Company, Vibration Mountings & Control Co.

Manufacturer of seismic restraint equipment and the vibration isolators for isolated equipment shall be the same manufacturer.

1.07 SPECIAL SOUND QUIETING:

The seismic and vibration control manufacturer shall analyze the operating conditions and make recommendations for any modifications and additions to the Owner's Representative.

1.08 SEISMIC REQUIREMENTS:

All mechanical equipment, piping and ductwork shall be braced, snubbed or supported to withstand seismic disturbances and remain operations. Furnish all engineering, labor, materials and equipment to provide protection against seismic disturbances as specified herein.

Isolated Equipment:

All vibration isolated equipment shall be mounted on rigid steel frames or concrete bases as described in the vibration isolation section of this specification unless the equipment manufacturer certified direct attachment capability. Each spring mounted base shall have a minimum of four all-directional seismic snubbers that are double acting and located as close to the vibration isolators as possible to facilitate attachment both to the base and the structure. The snubbers shall consist of interlocking steel members restrained by shock absorbent rubber materials.

Elastomeric material shall be replaceable and a minimum of 3/4" thick. Snubbers shall be manufactured with an air gap between hard and resilient material of not less than 1/8" nor more than 1/4". Snubbers shall be installed with factory set clearances. Snubbers shall be equal to Mason Z-1011.

A one "g" minimum vertical and lateral level shall be used in the design of all snubbers restraining isolated equipment.

Piping:

All isolated and non-isolated piping 2 1/2" I.D. and larger shall be protected in all planes by restraints to accommodate thermal movement as well as restrain seismic motion. Locations shall be as scheduled and shall include but not be limited to:

a. At all drops to equipment and at flexible connections.
b. At all 45 degree or greater changes in direction of pipe.
c. At horizontal runs of pipe, not to exceed 30 feet O.C. spacing.

d. Piping shall be restrained by a cable restraining system using a minimum of two cables at all restraint points.

e. Shop drawings shall be submitted with the locations of all restraints shown on a floor plan and noting the size and type of restraint to be used.
f. Gas piping shall have additional restraints as scheduled.

Ductwork:

All isolated and non-isolated rectangular ductwork 4 sq. ft. in cross-sectional area and larger and all isolated and not isolated round ductwork 28" diameter and larger shall be protected in all planes by restraints to accommodate thermal movement as well as restrain seismic motion. Locations shall be as determined by the Seismic Restraint Manufacturer and shall include but not be limited to:

a. All horizontal runs of ductwork, not to exceed 30 feet O.C. spacing.
b. At all 45 degree or greater changes in direction of ductwork.
c. At each end of duct runs and drops to equipment.
d. At each flexible connection.
e. Ducts shall be restrained by a cable restraining system using a minimum of two cables at all restraint points.
f. Shop drawings shall be submitted with the size and type of all restraints to be used. A floor plan shall be provided to show the locations of all restraints.

1.09 VIBRATION ISOLATION REQUIREMENTS:

All mechanical equipment 1 horsepower and over, unless otherwise noted, shall be isolated from the structure by means of resilient vibration and noise isolators in accordance with Table 27, Chapter 52 in the 1987 HVAC Systems and Applications ASHRAE Handbook. Vibration isolators shall be designed and supplied by the manufacturer supplying seismic restraint equipment. Vibration isolation equipment, including spring isolators, spring and rubber hangers, resilient pads, rails, inertial bases, etc., shall be by Mason M.W. Sausse, Korfund, Amber Booth or Vibration Mountings and Control Co. or equal. All model numbers herein refer to Mason. All such isolation equipment shall be supplied by a single manufacturer.

For equipment on ground - support slabs adjacent to sensitive areas, use recommendations in the 20 ft span column, Table 27, Chapter 52 of the 1987 ASHRAE Handbook.

Equipment Support:

Condensing Units: Neoprene Pads

All piping and ductwork shall be installed to prevent transmission of noise and vibration into the structure.

All piping and high pressure ductwork in the mechanical equipment room and piping and high pressure ductwork three supports away or 50 ft. (whichever is greater) from other mechanical equipment shall be isolated from the structure by means of vibration and noise isolators. Suspended piping shall be isolated with combination spring and fiberglass hangers in the supporting rods. Floor-mounted piping shall be supported directly on spring mounts.

Vertical pipe risers shall be isolated from the structure by means of vibration and noise isolating expansion hangers. The hangers shall have a minimum rated deflection of four times the anticipated pipe movement and shall be enclosed in a housing for fail-safe equipment.

Flexible connectors shall be incorporated in the piping adjacent to all reciprocating equipment.

Flexible connections shall be incorporated in the ductwork adjacent to all air moving units.

SECTION 15600 - HEATING AND AIR CONDITIONING

1.01 GENERAL AND SPECIAL CONDITIONS:

The General and Special conditions and the General Mechanical Requirements are a part of this section insofar as they shall apply.

1.02 SCOPE:

This section shall include complete installation of the following:

A complete new heating and cooling system.
A complete air distribution system.
A complete system of temperature control.

1.03 MATERIALS:

Ductwork shall be galvanized steel.

Flues shall be Metalbestos type "B" with Breidert type "L" cap. Exhaust duct caps shall be Breidert type "L".

Flexible duct shall have 1" insulation with plastic cover a maximum of 2' - 0" long at diffusers and shall be Genflex or equal.

Future flues, intakes and sleeves shall be Sch. 40 PVC with solvent welded joints.

1.04 STANDARDS:

The construction of all ductwork, including gauges, of metal bracing layout, etc;., shall be in accordance with the following manuals of the Sheet Metal and Air Conditioning Contractor National Associates, Inc., unless otherwise noted.

Low velocity ductwork and plenums shall be in accordance with SMACNA "Low Velocity Duct Manual", Third Edition.

Round duct shall be spiral would galvanized steel in accordance with SMACNA "High Velocity Duct Manual".

1.05 INTERIOR DUCT INSULATION:

Supply and return air ductwork from the outlet of the rooftop unit for a distance of 10'-0" shall have 1" of interior duct insulation. Duct dimensions shown are net inside dimensions and duct shall be increased 2" on a side to accommodate insulation. Insulation shall be 1.5 # density.

Insulation materials, adhesives, coatings, and other accessories shall have surface burning characteristics as determined by ASTM E 84 not to exceed 25 for flame spread and 50 for smoke developed flameproofing treatments subject to deterioration due to the effect of moisture or high humidity are not acceptable.

Install mat finish surface on air stream side. Secure insulation to cleaned sheet metal duct with a continuous 100% coat of adhesive and with mechanical fasteners spaced per SMACNA recommendations. Pin all duct liner.

Accurately cut liner and thoroughly coat exposed edges of duct liner, including diffuser drop cut-outs with adhesive to seal fibers. Butt joints tightly. Top and bottom sections of insulation shall overlap sides.

1.06 ELBOWS:

Elbows shall be made with radius to the center of the elbow at least 1.5 times the duct width parallel to the radius, or double thickness turning vanes, installed.

1.07 EXTRACTORS AND SPLITTER DAMPERS:

Extractors shall be provided ahead of each sidewall register inside of duct and where shown on the drawings. Extractors shall be adjustable with manual adjustable lever. Operator to be complete with locking quadrant and shall be located so as to be readily accessible. Extended shafts with bearing plates and operators shall be installed where adjustment arm s not readily accessible from face of register. Extended arms and/or miter gears shall be installed where operator on duct is not readily accessible. Cover plates in finished areas shall be chrome plated.

Splitter damper shall be installed where shown and at all take-offs as required. Controls including operator and accessories shall be the same as for extractors.

1.08 VOLUME DAMPERS:

Furnish and install in each duct where called for on the drawings in low pressure ductwork American Foundry and Furnace Co. type F-18 or equal by Air conditioning Products, multiblade proportioning volume dampers with opposed blade linkage and shaft extended thru the frame. An indicating lock quadrant shall be installed on the shaft.

1.09 DAMPER REGULATORS:

All volume dampers and splitter dampers in exposed ductwork shall be provided with Ventlock No. 640 or Young No. 443 damper regulators. In finished areas, over plates shall be chrome finished.

1.10 FIRE DAMPERS:

Furnish and install fire dampers in ductwork thru all floors and fire walls as shown. Dampers shall be fusible link multiblade, 14 gauge steel spring-acting with 14 gauge sleeve for wall thickness shown with mounting angles. Dampers need not bear the U.L. Label, but shall have written certification that they meet latest NFPA requirements and shall be approved for location shown. Damper location and installation shall be as required in NFPA No. 90A, latest edition. Damper shall be positioned outside of air stream when open.

Sizes shown on drawings are for clear free area when damper is in open position. Dampers shall have some pressure ratings as ducts in which they are installed. An 8" X 8" hand hole shall be installed at each fusible link of fire damper in ductwork. A sheet metal cover shall be provided over access hole. Cover shall be insulated where duct is insulated.

Dampers shall be Tuttle & Bailey Model "F" or duct and application required. Equal dampers of Affco, Ruskin, or Dowco are acceptable.

1.11 REGISTERS, DIFFUSERS AND GRILLES:

Furnish and install registers, diffusers and grilles of size shown on the drawings and described herein. All grilles and registers, complete with a frame with rubber gasket suitable for the area and wall construction shall

be installed where shown on the drawings. All registers shall be complete with a key-operated opposed damper integral with the grille.

Finish for all registers, diffusers, grilles, etc., shall be as selected by the Architect or as noted herein. All data to be certified and all tests performed in accordance with requirements of the Air Diffusion Council. For convenience and to establish quality and function, Manufacturers and their model numbers are used herein and on drawings. Items shall be Carnes, Titus, Tuttle & Bailey, Krueger, Agitair or as noted.

Registers, grilles and diffusers where not specifically noted otherwise:

Ceiling supply diffusers shall be Tuttle & Bailey
Type “M" with 24" X 24" face for lay-in ceilings.

Ceiling grilles shall be Titus GC-50, 1/2" X 1/2"
eggcrate aluminum with baked white enamel finish.

Sidewall supply registers shall be Titus CT-481 Type 13 border c/w damper. 15 deg. shall be upward.

Sidewall return grilles shall be the same as supply less damper.

1.12 AIR HANDLING UNIT

General:

Furnish and install where shown on the plans, McQUAY central station air handlers or approved equal. Sizes, types and performance shall be as indicated in the unit schedule. Each unit shall be complete with factory furnished components as shown on the plans and ARI certified per standard 430.

Cabinets shall be of sectionalized construction and all sheet metal parts, including accessories, shall be fabricated of continuous galvanized steel. Access shall be provided to the interior of the unit.

Blower Section:

Fans shall be airfoil DWDI type with galvanized steel scroll housing. The entire fan assembly shall be completely isolated from the unit bulkhead with neoprene gasketing and mounted on 1-inch deflection spring isolators.

All fans shall be dynamically balanced before and after being installed in the fan cabinet section. Fan cabinet shall be internally insulated with 1-inch thick neoprene coated glass fiber (not required on heating and ventilating units). Units shall have solid steel shafts mounted in heavy-duty 200,000 hour relubricative ball bearings. Maximum fan RPM shall be well below the first critical speed. Bearings shall be self-aligning, grease lubricated ball type. All bearings shall be equipped with lubrication fittings. Motors shall be 208V 60 Hz 3P type with minimum horsepower as tabulated in the unit schedule. Motors shall be located as shown on the plans.

Cooling Coil Section:

Shall be fabricated of continuous galvanized steel. All cooling coil section panels shall be internally insulated with 1-inch thick neoprene coated glass fiber insulation. Coil section shall include a condensate drain pan. All coils shall be arranged within the coil section for horizontal air flow. Where multiple cooling coils are used in a single unit, intermediate drain pans shall be provided. Coil headers and refrigerant distributors shall be completely enclosed within the insulated casing with only connections extended through the cabinet.

Drain Pan:

The drain pan shall be of double pan construction with the inner pan covered with a heavy coat of mastic and thermally isolated from the exterior casing with 1-inch insulation.

Coils:

All coils shall be per the schedule. Coil performance data shall be certified in accordance with Air Conditioning and Refrigeration Institute (ARI) Standard 410. Coil performance shall be substantiated by computer generated output data.

Refrigerant Coils:

Cooling coils shall be designed for use with Refrigerant. Sweat type copper suction connections shall be located at the bottom of the suction headers for gravity oil drainage. Pressure type liquid distributors shall be used.

Water Heating Coils:

Water heating coils shall be furnished as indicated on the unit schedule.

Filter Section:

Furnish factory built angular filter section complete with filters as specified herein. The filter area shall be specified on the unit schedule. Filter sections shall have access doors on both ends.

Filters:

Filters shall be disposable type 2" thick.

Mixing Box:

Mixing damper shall be furnished where shown on plans. Dampers shall be arranged so that the fresh and return airstreams merge when entering the mixing box. Blades shall be parallel acting and interconnected. Damper rods shall rotate in nylon bushings.

1.13 LOUVERS:

Furnish and install prime coated, 18 gauge galvanized stormproof louvers with flange for metal building of size shown on drawings. louvers shall be 4" thick with stormproof blades and shall be complete with 1/4" mesh galvanized screen behind louver. Louvers shall be Affco or equal of Dowco.

1.14 AIR BALANCE:

Balance equipment, air damper, diffuser and registers so that all rooms or areas are supplied with or have exhausted from them their proper proportion of air to the entire satisfaction of the Architect and the Owner. Submit two (2) copies of typewritten report giving results of the final balancing.

The balancing contractor shall make any necessary changes in balancing as are requested by Architect in air quantities or direction of blow to prevent disturbance where applicable.

1.15 AUTOMATIC TEMPERATURE CONTROL:

This Contractor shall furnish all labor and materials for a complete electrical temperature control system.

Thermostats shall be furnished and mounted by this Contractor and shall be wired by the Mechanical Contractor. All thermostats shall have locking adjustments and shall be mounted at 5'-6". Thermostats shall be mounted for wiring to run concealed.

The complete system shall be installed and guaranteed against defects in material and workmanship for a period of one (1) year from date of acceptance,

Upon completion of the project this contractor's representative shall spend the necessary time with the building's operating personnel to instruct them on the operation of this system. The services shall be performed without cost to the Owner.

Sequence of control

Air Handling Unit:

A wall mounted 7-day programmable thermostat shall control space temperature.

SECTION 16050 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 General Conditions

A. Contractors proposing to do work covered under the Electrical Section of these specifications shall perform his entire operations in strict accordance with all requirements of this section of these specifications.

B. The General Requirements of these specifications, which are bound herewith are hereby made a part of this section of these specifications to the same extent as if written herein in full and each contractor proposing to do work covered under the Electrical Section of these specifications shall perform his entire operation in strict accordance with all the requirements thereof, in so far as they pertain and are applicable.

C. Related Documents: Drawings and general provisions of contract, including General and Supplementary Conditions and Division -1 Specification Sections, apply to work of this section.

1.02 Scope

A. The General Requirements of Electrical Work shall apply to all phases of the electrical work and shall be complimentary to, and not in lieu of, the General Conditions which form a part of these specifications.
1. The electrical contractor shall include the conditions imposed by the Bidding Requirements, Contract Forms, General Conditions, and Amendments to General Conditions in their bidding.
2. The term Contractor used in this division of these specifications shall mean the Electrical Contractor.

B. The work included under this Division of these specifications shall further include the furnishing of all materials and equipment in the performing of all labor and services necessary to the complete installation of an electric wiring system for power and lighting service, including all related systems and accessories for the contemplated building, all as shown by the drawings and hereinafter specified.

C. All work covered under this section of these specifications shall be performed in strict accordance with the latest requirements of all the regulating agencies mentioned hereinbefore and shall comply with the applicable ordinances and regulations of the local governing authority.

D. The scope of work shall include the following general listings, in addition to which the contractor shall furnish and install all required hangers, supports, sleeves and such other items and appurtenances as may be required for complete operating systems as intended by these contract documents:
1. The installation of a concealed, interior distribution and wiring system, with all connections for power and lighting, including main switchboard, distribution panelboards, feeders, lighting panels, circuit breakers, disconnect switches, conduit, junction and pull boxes, outlet boxes, conductors, wiring devices, etc.
2. The complete installation of the lighting fixtures as shown and scheduled.
3. All wiring and disconnects necessary for the proper installation and connection of any starter and/or other control devices called for under this or any other section of these Specifications.
4. Roughing-in for and making final connections to all equipment furnished and set in place under Division 15 or Division 16 of these specifications.

1.03 Plans

A. Before starting his work, the contractor shall examine the plans and if any discrepancies occur between them or between them and the specifications, he shall report same to the Architect in writing and obtain written instructions for changes in the work.

B. Review all work indicated on drawings and specified herein with proper authorities responsible for interpreting applicable codes, Owner's Representative, and local inspector prior to commencement with construction as listed herein, but not necessarily limited thereto:
1. Visit site prior to executing bid.
2. Verify measurements and locations of field measurements of existing conditions and those developed by construction.
3. Confirm requirements of work at off-site, publicly owned property with local authorities.
4. Confirm connection requirements, sizes and layout with local public utilities.
5. Conditions discovered in conflict with intent of drawings and/or specifications must be clarified with Architect prior to execution of work.

1.04 Grounding

A. All metallic conduits, supports, cabinets, enclosures and electrically operated equipment shall be grounded in accordance with the latest regulations of the NEC.

1.05 Fees and Permits

A. Each contractor shall have a current license in the state of Utah and shall obtain all permits and licenses required for his work. Owner shall pay all fees in connection with same.

1.06 Codes and Inspections

A. All work shall be done in strict accordance with all applicable city, county, state DFCM and national codes, specifications, and ordinances.

B. All materials and workmanship shall comply with all applicable state DFCM and national codes, specifications, and specified industry standards.

C. In case of differences between building codes, specifications, state laws, industry standards and the contract documents, the most stringent shall govern.
1. The contractor shall promptly notify the Architect in writing of any such differences.
2. Should the contractor perform any work that does not comply with the requirements of the applicable building codes, state laws or industry standards, he shall bear all costs arising in correcting these deficiencies.

D. In addition to the aforementioned ordinances, the following industry standards shall apply as applicable except that where the requirements of this specification are more stringent than the following standards, they shall take precedence:
1. AIEE American Institute of Electrical Engineers
2. ANSI American National Standards Institute
3. ASTM American Society of Testing Materials
4. IES Illuminating Engineering Society
5. NBFU National Board of Fire Underwriters
6. NEC National Electrical Code
7. NEMA National Electrical Manufacturer's Association

8. UL Underwriters Laboratories
9. NECA National Electric Contractors Association
10. OSHA Occupational Safety and Health Act
11. Utah State DFCM Requirements

E. The drawings and these specifications are intended to comply with all the aforementioned rules and regulations; however, some discrepancies may occur.
   1. Where such discrepancies occur, the contractor shall immediately notify the Architect in writing of said discrepancies and apply for an interpretation. Should the discovery and notification occur after the execution of a contract, any additional work required for compliance with said regulations shall be paid for as covered by these contract documents, providing no work or fabrication of materials has been accomplished in a manner of non-compliance.
   2. Should the contractor fabricate and/or install materials in a manner that does not comply with the applicable codes, rules and regulations, the contractor who performs such work shall bear all costs arising in correcting these deficiencies to comply with said codes.

1.07 Local Customs

A. Each sub-contractor shall comply with all local customs as to which particular trade shall install any part or parts of any work or equipment specified herein.

1.08 Examinations of Site

A. The contractor shall visit the site of the proposed work and examine conditions and limitations thereof, no extra payment will be allowed because of lack of knowledge of such conditions.

1.09 Drawings and Specifications

A. These specifications and the drawings accompanying same are intended to cover systems which fit into the several available spaces and which will insure complete and satisfactory systems as described thereinafter under the several specific headings.
   1. Each bidder shall, therefore, carefully examine the plans and be responsible for the proper fitting of his material and apparatus into the building.
   2. The electrical contractor shall carefully lay out his work at the site to conform to the structural conditions, to avoid all obstructions and to conform to the details of the installation supplied by the manufacturer of the equipment to be installed and thereby to provide an integrated satisfactory operating installation.
   3. All electrical wiring to be installed in conduit, (3/4" minimum size). No metal clad "MC" type cable or electrical non metallic tubing "ENT" will be allowed unless specifically noted.
   4. The electrical plans do not give the exact details as to the elevations of conduit runs and they do not show the location of these conduit systems to scale.
   5. Before installation of these systems, the electrical contractor shall refer to the General Construction as it is then in progress and determine the exact location of these conduit systems in conjunction with the advice from the Architect and/or his representative.

B. All devices necessary for the installation and support of the conduit systems and equipment, such as sleeves, inserts, etc., shall be located and installed as the construction progresses in order to allow completion of each phase of the work in the proper sequence.

C. The Scope of Work placed in the front part of each section of specifications is intended to designate the scope and locations of all items of the work included therein either generally or specifically. It is

not, however, intended to limit the scope of the work where plans, schedule or notes indicate an increased scope.

D. When the electrical drawings do not give exact details as to the elevations of conduit and ducts, the contractors shall physically arrange the systems to fit the space available at the elevations intended with the proper grades for the functioning of the system involved.
   1. Exposed conduits are generally intended to be installed true and square to the building construction, and located as high as possible against the structure in a neat and workmanlike manner.
   2. Work shall be concealed in all finished areas.

E. The drawings showing the extent and arrangement of the work of a particular trade must be used together with the drawings showing the extent and arrangement of the work of the other trades and this contractor shall lay out his work with due consideration for the other.

1.11 Substitutions

A. The equipment specified carries brand names and catalog numbers and shall be interpreted as establishing a standard of quality. Substitutions will be considered if a duplicate written application (2 copies) is at the office of the engineer as per general conditions of the specifications. The application shall include the following: 1) A statement declaring the equipment proposed is equal to that specified by having the same physical characteristics and dimensions, meet the drawings layout and structural conditions as well as load requirements; 2) The specified submittal catalog numbers of the equipment under consideration; 3) A pictorial and specification brochure; 4) Sample may be required at engineers discretion; 5) Additional information as may be noted on drawings. Substitution approvals will be by the Engineer, Architect and Owner and listed by addendum prior to bid date.

B. Any conflict arising from the use of substituted equipment shall be the responsibility of the supplier, who shall bear all costs required to make the equipment comply with the intent of the plans and specifications.

C. At the option of the Architect, samples may be required for non-standard items before installation during construction.

D. No materials or apparatus shall be substituted after the bid opening except where the equipment manufacturer has been discontinued or delivery becomes a problem, then written approval of the Architect is required.

1.12 Shop Drawings and Samples

A. Each contractor shall submit shop drawings and/or diagrams for job coordination in all cases where deviations from the contract drawings are contemplated because of the job conditions, interferences or substitution of equipment, or clarification of contractor's intent.
   1. He shall also submit detailed shop drawings, rough-in sheets, etc., for all special or custom built items of equipment.

B. These drawings and diagrams shall show all conduit and wire sizes as well as the manufacturer's name and catalog number of each piece of equipment being used and shall be drawn accurately to scale.

C. Eight copies of submittal shop drawings and complete engineering submittal data shall be made within thirty days after signing a contract.
   1. The contractor shall correlate the submittal data of the particular items as designated on the

plans or in these specifications and all this data shall be indexed and in 3-ring loose leaf binders. All data shall be submitted at one time, piece-meal submittal will not be accepted.

D. Submittal data will be returned unchecked unless the following information is included: contractor's signature, indicating his qualified certification that the equipment will fit the space shown, complete with all requirements of the plans and specifications, reference to all pertinent data in the specifications or on the drawings, size and characteristics of the equipment, name of the project and a space large enough to accept an approval stamp.

E. Submittals must indicate proper arrangements to suit installation and maintenance requirements. Fixtures shall be compatible with ceiling construction for mounting type and accessibility. Compare mounting trim and details with details on architectural plans, Electrical Contractor will review submittals with respect to schedules, spec. drawings, and details. Clearly mark equipment submittal sheets indicating equipment symbol and exact location of proposed equipment.

F. Review of Shop Drawings and Brochures shall not relieve the Contractor of responsibility for dimensions and/or errors that may be contained therein, or deviations from the Contract Document's requirements. It shall be clearly understood that the noting of some errors but overlooking others does not grant the Contractor permission to proceed in error. Regardless of any information contained in the Shop Drawings and Brochures, the requirements of the Contract Documents shall govern and are not waived, or superseded in any way by the review of the Shop Drawings and Brochures.

PART 2 - PRODUCTS

2.01 Access Doors

A. Electrical sub-contractor to furnish and install all access doors necessary for proper access to electrical junction boxes. They shall be similar in all respects to those approved by the architect. All locations shall be coordinated by the architect prior to rough-in.

2.02 Equipment Connections

A. Provide the materials and make the electrical connections to all equipment having electrical requirements as indicated in the architectural and/or mechanical section of the specifications and drawings.

B. Provide conduit, wiring, connect motors and other mechanical equipment and electrical devices in other sections; also install, provide, support for, and connect starters, other control devices, control panels, furnished for such motors and equipment; complete all circuits; leave in satisfactory operating conditions.

C. Provide control devices for equipment in addition to those furnished by the trades providing such equipment; refer to schedules on electrical and mechanical drawings for control devices to be furnished under scope of the electrical work.

D. Control devices and panels furnished by trades providing equipment will be delivered to electrician at site of project; acknowledge acceptance in writing; assume responsibility for particular installation before proceeding with installing and wiring them. Following each manufacturer's printed installation directions and wiring diagrams for installing and making connections to his equipment and controls.

E. Consult contract drawings and specifications of trades providing equipment and controls, for control

wiring diagrams, also refer to their shop drawings in order to become familiar with equipment type and operation of controls, their locations and extent of work required for installing, wiring and connecting them.

F. Starters for all motors requiring same shall be furnished by electrical contractor. Provide three overloads for each starter.

PART 3 - EXECUTION

3.01 Execution of Work

A. Each contractor shall plan, schedule and execute his work so as not to interfere with the work of other sub-contractors in the building, or on the premises.

3.02 Supervision and Observation

A. Each contractor shall keep a competent superintendent or foreman on the job at all times who shall be fully responsible for the supervision of the work.

B. The Architect and/or Owners authorized representative shall have the right to observe all work at anytime and shall be consulted for any interpretation of the plans and/or specifications required by this foreman for the proper installation of his work.
1. Each contractor shall have a representative present when his work is being observed and shall give assistance as may be required.
2. Recommendations made by the Architect and/or Owner's authorized representative shall be promptly carried out.

C. The Architect and/or Owner's authorized representative may observe the work from time to time for the express purpose of verifying compliance by the contractor with the contract documents.
1. Such action on the part of the Owner and/or Owner's authorized representative shall not be construed as construction supervision nor shall such action indicate approval of the work.

3.03 Transportation, Scaffolding and Hoisting

A. Each contractor shall provide the necessary transportation to facilitate the delivery of all materials, equipment, tools and labor to the job to perform the work in accordance with the intent of these documents.

B. Each contractor shall provide his own scaffolding, ladders, and facilities for making his installation in accordance with the intent of these contract documents and for facilitating the necessary adjustment and balancing, installation of lamps and cleaning of fixtures and devices.

C. Each contractor shall provide his own hoisting facilities to set his materials and equipment in place as indicated on the drawings.

3.04 Storage of Materials

A. Each contractor shall provide space for storage of materials, equipment or tools at ground level.
1. Any storage contemplated within the building will be allowed only upon specific approval of the Architect.

3.05 Delivery and Protection

A. All larger pieces of apparatus, which are to be installed in the building and which are too large to permit access through doorways, stairways, or shafts, shall be brought to the job by this contractor and placed in the spaces before the enclosing structure is completed.
   1. All apparatus shall be cribbed up from the floor and covered with tarpaulins or other protective covering.
   2. Damage resulting from failure to comply with this requirement by the contractor shall result in the rejection of the damaged equipment.

3.06 Protection of Structure and Materials

A. Each contractor, in performing his work, shall take particular care not to damage the structure.
   1. All finished floors and step treads shall be covered to prevent any damage by workmen and their tools and equipment during the construction of the building. In addition, each contractor shall protect any materials on the job site whether a part of his contract or property of another contractor.

3.07 Protecting Work

A. Each contractor shall provide lamps on all obstructions at night and shall guard openings in the proper manner.

3.08 Sleeves

A. Where conduit passes through walls, floors, or other masonry surfaces, steel pipe sleeves shall be used, except through slabs on grade.
   1. The inside diameter of these sleeves shall be at least one-half inch greater than the outside diameter of the conduit to be inserted.
   2. After the pipes are installed, the contractor shall fill the annular space between the pipe and its sleeve with a fire resistant silicone foam equal to chase foam #CTC PR-855 Fire Stop.
   3. The filler shall be suitable for the temperature of the pipe surface, shall not run and shall form a watertight joint.

B. Sleeves passing through floors shall be set to project above finished floors and be flush with the underside of the slabs.

C. Where conduits pass through interior walls or floors, rigid conduits may be used in lieu of the steel pipe sleeves, provided they have approximately the same inside diameter of the sleeves specified above.

D. All openings around pipes and ducts where they pass through fire rated walls or floors shall have opening between wall and pipes or duct, sealed with Dow Corning 3-6548 RTV foam or 3M Brand Fire Barrier Caulk CP-25 or Putty 303 to maintain rating of wall or floor assembly. Install material per

the manufacturer's requirements. Provide mineral composition back-up board and other components as required for complete installation.

3.09 Waterproofing

A. In any case where a sub-contractor finds it necessary to cut holes through the waterproofing of exterior walls or floors to support or install the work, he shall waterproof the hole with the same waterproofing

materials as were used for the original waterproofing before cementing in the device to be installed.

3.10 Foundations

A. Each contractor furnishing equipment covered under these electrical specifications shall provide foundations, as specified hereinafter:

1. Concrete special bases to be furnished by this contractor and shall be provided for each and every piece of floor mounted equipment. Base shall be not less than 4" high unless otherwise noted, and shall be poured in forms built of new dressed lumber.
2. All corners of the foundations shall be neatly chamfered by means of sheet metal or triangular wood strips nailed to the form.
3. Foundation bolts shall be placed in the forms when the concrete is poured the bolts being correctly located by means of templates.
4. Approximately one inch shall be allowed between equipment bases and concrete for alignment and grouting.
5. Equipment shall be set in place, leveled and aligned by means of shims, then grouted-in, in that order.
6. After grouting, the forms shall be removed and the surface of the foundation shall be hand-rubbed with carborundum.

3.11 Hangers and Supports

A. All conduit shall be adequately supported from the structure as specified hereinafter.

B. Where exposed single conduits are secured to any ceiling or wall, Appleton, cadmium finish, one screw clamps with clamp backs designed to prevent moisture collection and allow conduit entrance to boxes without bends shall be used.

C. Where multiple conduits are installed, Kindorf channel supports with conduit clamps shall be used. Channels shall be attached to structure above utilizing concrete inserts, beam clamps, or ceiling flanges as required to suit type of construction, approved spacers shall be used to prevent continuous contact with building.

D. Sizes of clamps, inserts, channels and all other supporting members shall be sized by contractor to handle a load equal to 200% of the combined weight of all supported material.

E. Spacing of hangers shall be as follows:

Electric Metallic Tubing

3/4" size	5'-0" on centers
1" to 1-1/4" size	6'-0" on centers
1-1/2" to 2" size	8'-0" on centers

F. Where several conduits of different sizes are supported on a common trapeze hanger, supports shall be spaced to accommodate smaller size pipe involved.

3.12 Electric Wiring

A. It is the responsibility of the electrical contractor to carry out all wiring required for the installation of all power to each and every motor-driven or electrically operated unit of equipment. The contractor

shall refer to the plumbing, heating and air conditioning specifications including the temperature control specifications for the scope of the connections to equipment furnished under those contracts and shall be determined from the contractor for those trades, by actual measurements at the site, or by direction from the Architect for the exact locations of all items.

1. The contractor shall request in writing the drawings he requires in ample time to permit preparation of the drawings and to permit proper installation of all wiring.

B. All conduits shall terminate in conduit boxes on motors where possible.

1. Where motors are not provided with conduit boxes, terminate the conduit in a condulet at the motor.

C. Where disconnect switches are not provided integral with the control equipment for motors, the contractor shall provide and install all disconnect switches required by the National Electrical Code.

1. Generally, all disconnect switches shall be enclosed, externally operable switches of adequate size for the duty intended.
2. These switches shall be installed as closely as possible to the motor or controls they serve and shall be within sight of the motor.

3.13 Cleaning

A. Each contractor shall at all times keep the premises free from accumulations of waste materials or rubbish caused by him, his employees or work.

1. This debris shall be completely removed from the building and from the site.

B. At the completion of the job, each contractor shall remove all his tools, scaffolding and surplus materials and shall leave the areas "broom clean."

3.19 Record Drawings

A. Conform to requirements of general conditions. Provide, in project office, one (1) complete set of "reproducible" construction documents (drawings and specifications) and during progress of work, record thereon, in red ink, any and all variations encountered during construction. At completion and prior to final payment, return record drawings and specs to Owner's authorized representative.

3.20 Guarantee

A. The contractor shall guarantee all work covered by the respective section of the specifications under which his contract was performed to be free from faulty, defective, or improper materials or workmanship for a period of one year from the building acceptance date.

1. Should any such failure occur during said guarantee period, the contractor shall, at his own expense, amend and make good all such defects, settlements and/or faults.

3.21 Cooperation and Coordination

A. This contractor shall be advised that time is of the essence in the completion of this project and/or any part thereof.

1. Therefore, in order to provide the Owner with completed, operational areas, systems and equipment, components, etc., this contractor will cooperate with all other contractors, the Owner, and suppliers and installers of other materials and equipment and shall coordinate his operations so that such items may be put to beneficial use of the Owner at the earliest possible date.

3.22 Occupational Safety and Health Act

A. Each bidder shall thoroughly inform himself of the provisions in the Williams-Steger Occupational Safety and Health Act of 1970, hereinafter referred to as OSHA, and in all subsequent revisions and amendments to that ACT and in all Rules and Regulations implementing the provisions of the ACT and shall make adequate allowance for compliance therewith prior to submitting his Bid.

B. Should there be conflict between any provisions of the Plans and Specifications and OSHA, they shall be reported in writing to the Architect seven days or more prior to the date of receipt of Bids, so that suitable correction may be made. The absence of such a written report shall signify compliance with OSHA requirements.

C. All construction practices, labor utilization practices, materials, machinery, equipment, tools, fuels, sources of energy, sanitary facilities, medical facilities, protective materials and devices, fire protection, and suppression systems and other factors, without limitation, affecting the safety and health of construction personnel Owner's authorized representative, Architect's representative, OSHA inspectors and all other personnel on or near the job site and/or the general public shall be in strict compliance with OSHA rules and requirements.

3.23 Project Finalization and Start-up

A. Upon completion of equipment and systems installation, assemble all equipment, factory representatives and sub contractors for system start-up.

END OF SECTION 16050

SECTION 16400 - SERVICE & DISTRIBUTION

PART 1 - GENERAL

1.01 General Conditions

A. The General Conditions, Supplementary General Conditions, Special Conditions, Alternates Addenda, Applicable Drawings and the Technical Specifications herein shall apply to all work under this section.

1.02 Scope

A. The work included under this sections of these specifications consists of the furnishing of all materials and equipment and in the performing of all labor and services necessary for the complete installation of the electrical conduit systems as shown by the drawings and hereinafter specified.

B. All work covered under this section of these specifications shall be performed in strict accordance with the latest requirements of all the regulating agencies mentioned hereinbefore.

C. The work shall be complete in all respects and shall include all devices and appurtenances, which are normal for the systems intended.
1. The entire conduit system shall be turned over to the Owner in a first class condition.

1.03 Standards

A. Standard of quality established by the electrical engineer through product and system approvals only after submittal of data supporting equally and in compliance with requirements specified herein and indicated on drawings. Approvals thereof will be issued by architect and electrical engineer.

1.04 Safety Regulations

A. The contractor shall furnish and place proper guards for prevention of accidents and shall provide and maintain any other necessary construction required to secure safety of life and property, including sufficient light for such protection and comply with local regulations.

1.05 Inspection

A. Prior to all work of the section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify that all electrical work may be installed in accordance with all pertinent codes and regulations, the original design, and the reference standards.

1.06 Discrepancies

A. In the event of discrepancy, immediately notify the Architect.

B. Do not proceed with the installation in area of discrepancy until all such discrepancies have been fully resolved.

PART 2 - PRODUCTS

2.01 Safety Switches

A. Switches shall be provided with quick-make, quick-break mechanisms and shall be heavy duty type and of the appropriate ampere rating.
   1. Those employed for motors and their feeders shall be horsepower rated switches.
   2. Switches for outdoor installation shall be provided with weathertight cabinets; those utilized for service entrance duty shall bear the UL label of approval for such service.

2.02 Fuses

A. Fuses shall be Bussman LPM Dual-element fuses, excepting for service entrance fusing, where they shall be Bussman "Hi-Cap" current limiting type fuses.

B. Fuses shall not be installed until the installation is complete and final tests and inspection have been made prior to energizing the equipment, including thorough cleaning, tightening of all electrical connections, inspection of all ground and grounding conductors and a test made for adequate insulation to ground on all circuits.

C. Any suggested changes in manufacturer of use type shall be accompanied by a complete short circuit and coordination study.

D. Fuses, 601 ampere to 6000 ampere, shall have interrupting rating of 200,000 ampere RMS symmetrical. Peak let-thru currents, lp, and energy let-thru values, 12t, shall not exceed the values established by Underwriters Laboratories Standard for Class L. fuses.

E. Fuses protecting circuit breakers or circuit breaker panelboards shall be silver-sand, fast-acting, current-limiting UL Class K-1 and R for amperages 0-600 and UL Class L for amperages 601-6000. LIMITRON Fast-acting fuse KTN,S,-R.

F. Fuses rated 600 amperes or less for all general power circuits shall be dual-element, UL Class R time-delay type. The interrupting rating shall be 200,000 amperes RMS symmetrical. peak let-thru current, lp, and energy let-thru values, 12t, shall not exceed the values established by Underwriters Laboratories Standard for Class K-5 fuses.

G. Upon completion of the building, the Contractor shall provide the Owner with spare fuses as shown below:
   1. Three fuses each rating installed 601 to 6000 ampere.
   2. 10% of each type and rating installed 0 to 600 Amperes, minimum of 6.

2.02 Motor Control

A. Branch disconnects to motors shall be fused. Fuses, 0 to 600 amperes, shall be Bussman Low Peak Dural-Element fuses sized not to exceed 125% of motor full load amperes (MFLA) for motors with 1.15 service factor and sized not to exceed 115% of MFLA for motors with 1.00 service factor. Fuses, 601 to 6,000 amperes, shall be Bussman Hi-Cap Class L Time-Delay fuses sized not to exceed 150% of MFLA. Abnormal motor starting conditions requiring fuse over sizing shall be referred to the engineer.

B. 1/2HP or less, 115 volt, single-phase motors shall be installed with Bussmann SSY box cover units. 3/4HP or less, 230 volt, single-phase motors shall be installed with Bussmann STY box cover units. Fuses shall be Bussmann Fustat Type, Fuse Ampere Rating and Fuse Location.

C. Branch motor Fuses shall be sized from motor nameplate ratings after motors are permanently installed. Two copies of an "as built" fuse list shall be furnished to the Owner. The fuse list shall contain Motor No., HP, MFLA, Fuse Type, Fuse Ampere Rating and Fuse Location.

D. Control circuits shall be protected in accordance with 1996 National Electrical Code. Control circuit fuses shall be furnished by the motor control manufacturer.

E. In addition to other required labels, Bussman Form L-C label listing fuse type, ampere rating and interrupting rating shall be affixed to each switch.

PART 3 - EXECUTION

3.01 Switchboard/Panelboard Wiring

A. All conductors within the cabinets of switchboards and panelboards shall be neatly laced together with plastic cable clamps, nylon banding or other approved means, and shall be of such length to allow ease of bending.

3.02 Final Connections

A. The Electrical Contractor shall rough-in for and make all final electrical connections, providing all required disconnects, boxes, connectors, conduit, conductors, etc., to the following equipment:
1. All line voltage mechanical equipment furnished under Division 15 of these Specifications basically all heating and air-conditioning equipment, etc.

3.03 Bushings, Locknuts and Connectors

A. Where rigid conduit enters a box of any description, the conduit shall be secured to the box with a locknut on the outside and a similar nut and bushing on the inside.

B. Where electric metallic tubing enters such boxes the conduit shall be connected to the box in an approved manner by a steel compression fitting with an insulated throat and locknut.

C. Conduit terminals at the boxes shall be provided with bushings. Bushings for conductors thru 250 MCM shall be O.Z. type E insulated end fittings selected for the size conductors involved.

D. Conduits shall be of such size and so installed that the conductors may be pulled in without undue stress or strain and shall be secured at cabinets and boxes of all types, with galvanized locknuts, both inside and out, and shall have appropriate bushings inside.

E. Rigid conduit shall be reamed after threading and shall be kept tightly capped and dry during construction.
1. All conduit shall be swabbed out before the wires are pulled through.
2. Bends shall be made with approved bending devices and those for conduit larger than one inch in diameter shall be factory-manufactured elbows.

F. Conduit which is larger than one inch shall not be run horizontally within any floor slab, and conduits

piercing roofs shall be equipped with pitch pans which shall be placed in position in time to be flashed by the roofing contractor.

G. Final connections to motors and electrically operated equipment shall be carried out by the use of a twelve inch or longer section of flexible steel conduit.
1. Flexible steel conduit shall also be employed to effect final connections to recessed lighting fixtures.
2. All flexible conduit in damp locations, this includes all basement areas and mechanical equipment rooms shall be neoprene jacketed, UL approved watertight complete with WP connections.

3.04 Junction and Pull Box

A. Junction and pull boxes one hundred cubic inches in volume or smaller shall be standard outlet boxes.
1. Those one hundred-fifty cubic inches or larger shall be constructed as specified for cabinet construction and shall be furnished with covers.
2. Boxes shall be coated inside and out to prevent corrosion.

B. Boxes shall be sized in accordance with the requirements of the National Electric Code and junction boxes not used for service entrance duty shall be not smaller than four inch square and one and one-half inches in depth with covers accessible at all times.
1. Boxes on concealed conduit shall be set with covers flush with finished plaster line unless otherwise shown.
2. Junction and pull boxes of appropriate dimensions for conduits and conductors shall be installed as shown or where necessary for the installation and pulling of cables and wires.
3. Covers shall be installed on all junction boxes and conduits after wiring and connections are made.

3.06 Outlet Boxes

A. At each outlet shown, furnish and install a box of suitable size and construction to serve the purpose properly.
1. Furnish and install plaster rings where required in connection with adjacent plaster finish where these occur.
2. In unfinished masonry walls furnish and install handy boxes of such size as the permit their being completely covered by the device plate. Boxes throughout, shall be galvanized steel.
3. All unused knockouts in boxes shall be filled or capped before plates or devices are installed.
4. Surface mounted boxes in damp or wet locations, and boxes mounted on a conduit stub-up shall be cast steel 'FS' boxes with threaded hubs, mounting ears, and weatherproof covers.

B. Ceiling outlets shall be four inch octagonal boxes of the appropriate depth and furnished with three-eighths inch fixture studs fastened through from back of boxes.
1. For plaster surfaces furnish and install plaster rings and ears.

C. At each switch or receptacle outlet shown, provide an approved switch box of the number of gangs indicated.

3.07 Pull Wires

A. In every empty conduit a nylon pull cord shall be left to facilitate the installation of conductors.
1. Pull cords shall be identified by linen tags and such shall be affixed to each end of such

cord; tags shall carry complete identifying information.

3.08 Conduit

A. All incoming service conductors above ground shall be housed in rigid, heavy wall, hot dipped galvanized steel conduit or IMC.

B. All underground conduit shall be rigid schedule 40 poly-vinyl chloride, PVC, which shall conform in all respects to the applicable requirements of ASTM D-1784, D-883 and 1600 and NEMA Standard 3-9-1967.

1. All such PVC conduit shall be Type II designed for underground installation, without encasement concrete, joined with EPC-40-PVC couplings of the solvent or screw type.
2. All such conduit systems shall be Underwriters Laboratories listed with bonding conductor in accordance with the latest edition of the National Electrical Code for underground use.
3. PVC shall not be used where penetrating floor slabs, beams, or foundation walls. Use GRC with 2 layers of electrical tape 1/2 lapped.
4. When penetrating foundation walls or other areas where settlement may occur, install GRC conduit 5 ft. beyond wall or footing.
5. No PVC conduit shall be used above grade.
6. Bends of PVC conduit shall be made so that the conduit will not be damaged and that the internal diameter of the conduit will not be effectively reduced. Field bends shall be made only with bending equipment identified for the purpose, and the radius of the curve of the inner edge of such bends shall not be less than shown in table 346-10 of the NEC.

3.09 Branch Circuit Home Runs and Sequence Phasing

A. All electrical wiring to be installed in conduit (3/4" minimum). No metal clad "MC" type cable will be allowed unless noted on the drawings.

B. In general, home run circuits to lighting outlets are schematically shown on drawings and shall be installed accordingly. Wire and raceway sizes of home runs, unless indicated otherwise, shall be #12 AWG THHN wire in 3/4 inch conduit. Each dimming circuit shall have a 3-wire separate neutral home run. Common neutrals will not be allowed.

C. Arrange all branch circuits to feed outlets in strict accordance with wiring diagrams on drawings; circuits to be 6-wire plus a ground conductor or as denoted.

D. Balance all branch circuits as nearly as practicable.

3.10 Grounding

A. The conduit system through the project shall be grounded as required by NEC.

B. All rotating equipment shall be grounded in compliance with the NEC.

C. Separate neutrals shall be installed on all GFI breakers or GFI outlets.

D. Conduit system and neutral conductor:

1. The conduit systems and neutral conductor or the wiring systems shall be grounded at the main service in accordance with article 250 of the NEC.
2. Primary and secondary equipment and circuits or combinations thereof in transformer rooms

shall be effectively bonded and permanently grounded as required by the NEC.

3. Where ground wire is run in metal conduit both ends shall be grounded with an approved grounding bushing.

G. System neutral conductor:

1. The system neutral conductor shall not under any circumstances be grounded after it has once been grounded at the service entrance disconnect. All grounding systems shall be interconnected and/or bonded to the main system ground.
2. A separate green grounding conductor shall be enclosed with the phase conductor in all raceways.
3. The neutral conductor shall not be used for equipment grounding and the neutral bar shall not be grounded to the distribution and branch boards.
4. Install a separate neutral conductor for each branch circuit, with a common ground conductor for multiple branch circuits unless noted to be a separate ground conductor.

3.11 Raceways

A. Conduit Ends:

1. Conduit ends shall be cut square and reamed to remove burrs and sharp edges; field threads shall be the same as and equal to factory threads.
2. Field bends and offsets shall be made without flattening, kinking, rippling or destroying the smooth bore or surface of the conduit and to not less than NEC minimum radius. Conduit that shows signs of rippling or kinking shall not be installed.

B. Concealed Conduits:

1. Conduits shall be run concealed in all finished areas, but may be exposed in unfinished areas, where so indicated or when permitted by approval of the Architect.
2. Concealed conduits shall be run in as direct a line and with bends as long as possible.
3. Exposed conduits shall be run parallel to or at right angles to the lines of the building.
4. Conduits shall not be installed closer than 12" to any hot water or steam line, measured from outside of insulation.

C. All wiring shall be installed in approved conduit raceways. Electrical metallic tubing may be used except where installed in earth, concrete slabs adjacent to earth, or in areas subject to mechanical injury, such as exposed raceways in mechanical equipment rooms. In all such cases, standard steel galvanized conduit shall be used. Tubing may be used in concrete slabs above grade level. No aluminum conduit will be allowed. Minimum size raceways for all systems shall be 3/4 inch.

D. In general, all conduit raceways shall be concealed within the ceiling, walls, and floors, except in locations where exposed raceways are specifically permitted, such as in equipment rooms and unfinished storage areas. In equipment rooms, if lighting raceways are run exposed, installation shall not be done until piping and duct work layout has been determined in order that lighting outlets may be located so as to avoid being covered by overhead ducts and pipes. If lighting raceways in equipment rooms are concealed in the structural ceiling slab, after mechanical work is completed, exposed conduit extensions shall be run to locate lighting fixtures where they are not obscured by work of other trades. Flexible metal conduit may be used where required for ease of installation. Do not use flexible metal conduit for feeds in and out of panelboards. A ground wire shall be pulled in all flexible metal conduit used.

E. Exposed raceways shall be run parallel or perpendicular to walls and ceilings on exposed structural members utilizing factory bends or steel fittings. Offsets shall be kept to a minimum.

F. Care shall be taken to ensure connections and a continuous metallic bond throughout length of conduit run. Tubing embedded in concrete shall utilize watertight fittings.

G. Precaution shall be exercised to prevent accumulation of water, dirt or concrete in the conduits during the execution of the work. Conduits in which water or foreign matter has been permitted to accumulate shall be thoroughly cleaned or the conduit runs replaced where such accumulation cannot be removed by methods approved by the architect.

H. No wire shall be installed until work which might cause damage to the wire or conduit has been completed.

I. Conduit which has been crushed, rippled, kinked or deformed in any manner shall not be installed.

J. Conduit, tubing and boxes shall be supported in an approved manner by means of expansion shields or other approved anchors in concrete or solid masonry, toggle bolts on hollow masonry units, wood screws on wood and metal screws on metal. Wooden plugs inserted in concrete or masonry units shall not be used as a base for fastening conduits, tubing, boxes, cabinets, etc.

K. Any conduit which pierces airtight spaces or plenums shall be sealed to prevent air leakage with a mastic acceptable to the architect/engineer/owner.

L. Conduits which pierce roof shall be flashed under the roofing section of the specifications in accordance with other applicable section.

M. The open ends of conduit shall be capped to keep out debris during construction.

N. Pull a mandril and swab through all conduit before installing conductors. All empty conduit shall be capped and left with a 200-lb., nylon pull cord installed.

O. All holes cut in fire-rated structures shall be properly sealed with materials that will provide the same fire rating.

3.12 Telephone/Data Raceways System

A. Furnish and install conduit and outlets for the telephone and/or data outlets.

B. A 200# nylon pull cord with cloth I.D. tags on each end shall be left in all empty raceways to assist cable installer.

3.13 Electrical Supporting Equipment

A. Raceways shall be supported to the structure at intervals not to exceed eight foot centers and within twelve inches of each junction outlet, device box or fitting.

B. Do not support conduits with tie wire, use approved conduit support systems.

C. Conduit shall not be attached or supported from ceiling support wire.

D. Anchoring methods shall be screws, screw nails, bolts, shield anchors, or a like device which will rigidly secure the supporting device. Wooden plugs, in masonry or nail-ups are not an approved method of support for conduit.

E. Toggle bolts, moly bolts, or screws in sheetrock or plaster are not acceptable as a support means for any equipment.

F. Fixtures mounted in or on grid type ceiling shall be safety-wired to building structure at two corners of a 1' x 4' or 2'x 2'fixture and 4 corners of a 2' x 4' fixture to meet seismic requirements for building location and area. Support wires are not to be fastened to grid hangers or grid hanger points of support.

3.14 Outlet Boxes

A. Remove knockouts only for entering conduit. If a knockout is mistakenly removed, plug shall be installed in the hole. Provide coverplates for all boxes.

B. Install boxes with rigid supports using metal bar hangers, or 2" x 4", 1" x 6" wood bridging between studs with screws. Welding boxes directly to metal joist and studs is not acceptable. Boxes set opposite in wall shall have at least 10" of conduit between them.

C. Ceiling fixture outlet boxes shall be 4-inch octagonal. Each box shall be mounted independently of the conduit to carry 200 lbs. Where three or more raceway entrances are made, use minimum box depth of 2 1/8". Where fixtures are to be installed provide with standard 3/8" stud.

3.15 Boxes-Junction and Device

A. Covers shall be used for switch and outlets run on surface. Boxes shall be securely fastened to the surface with approved anchoring means; wooden plugs shall not be allowed.

3.16 Conductors

A. All underground wiring shall in all cases be run in conduit.

B. The color code of wires shall match existing system.

3.17 Devices

A. All switches shall be heavy duty specification grade Hubbell 1221GY. Self-grounding receptacles shall be heavy duty specification grade, 20-amp, side wired Hubbell 5342GRY, all corridor outlets to be Hubbell 8300GY: Gray with stainless steel covers. Leviton, P&S approved alternates. All devices to be sidewired only do not back wire devices.

B. Mounting Heights:
(1) Wall switches - 48" to center of device
(2) Low convenience outlets - 16" to bottom of device above finished floor or 6" above equipment.
(3) Cabinet top outlets - 44" or 3" above top of splash ledge.
(4) Telephone - 16" above floor to bottom of device, pay telephone 48".

The above mounting heights are minimum standard and may vary according to plans and specifications for special usage. Where applicable, garage outlets may be mounted higher than the 18", but under no condition less than the specified 18" minimum.

C. Each GFCI protected outlet shall be a separate GFCI device, 20-amp minimum. Each GFCI protected

outlet shall be clearly marked "GFCI PROTECTED".

D. As described in NEC 210-8, GFCI will be provided for all restroom outlets, outlets installed in mechanical equipment rooms, outlets installed outdoors and in kitchens. Exception: Hazardous location. Articles 500 through 516 shall apply. Install GFCI protected outlets within six (6) feet of all sinks and at roof top mechanical equipment.

E. Receptacles: Shall be installed on individual branch circuits. A maximum of six (6) 20-amp receptacles shall be installed for each 20-amp single pole breaker.

F. Furnish and install all wiring device and coverplates as shown on the drawings. Confirm location, height, mounting conditions, etc., of all devices with the architectural plans before rough-in. Install a stainless steel weatherproof cover at all exterior devices.

G. Convenience outlets shall be mounted such that the front of the device is flush with the coverplates; mounting height to be 16" above floor to the bottom of the device, unless otherwise stated.

H. All floor receptacles shall include carpet or tile flanges complete where shown on the drawings unless installed flush in hardwood floor. Color of flange selected by architect. Obtain a dimensioned drawing from the Architect prior to installing any floor receptacle.

I. Switch, telephone and receptacle outlet boxes: not less than 4" square, with adapting tile or plaster covers where necessary to set flush with the finished surface. Where three or more conduits or EMT entrances are made, use minimum box depth of 2 1/8". A gang box shall be used where more than one switch or device is located at one point. Sectional boxes are not acceptable. In masonry wall where a tile or plaster ring cannot be used, install a single gang 3 1/2" deep box minimum, unless noted.

J. Standard or special outlet boxes shall be installed where special devices are indicated.

K. Four inch block walls shall have 4" square junction boxes equipped with a one-inch extension cover in the middle of the block. This leaves about one inch of block on either side of the box. The extension shall be set in the vertical position.

L. All recessed box openings shall be flush with finished surface, regardless of type of construction.

M. The power riser diagram sealed in plexiglass and trimmed with a metal frame shall be provided and installed at the main panel in the switch gear room (locate as directed).

N. Engraving Devices Plates: All device plates installed on devices other than the normal 120-Volt, One-Phase shall be engraved and filled with black filler, stating the characteristics such as 120-Volt, 30-Amp, 208-Volt, One-Phase, 20-Amp; 240-Volt, One-Phase, 20-Amp; etc.

O. All switch banks shall have each switch identified as to its function with micarta engraved, adhesive-backed plate.

P. Write with a felt tip pen that contains permanent ink on the inside of each device box, the circuit to which the device is connected. Example: Circuit "A2LA-3".

END OF SECTION 16400

SECTION 16500 - LIGHTING

PART 1 - GENERAL

1.01 General Conditions

A. The General Conditions, Supplementary General Conditions, Special Conditions, Alternates, Addenda, Applicable Drawings and the Technical Specifications herein shall apply to all work under this section.

1.02 Scope

A. Furnish and install lighting fixtures complete with lamps at all lighting outlets shown on the drawings. Each fixture type shall be in accordance with the light fixture schedule on the drawings. Fixtures shall not be installed until work of other trades in the vicinity will not result in damage to the fixtures. Nicks and scratches on the exposed surfaces of the fixtures shall be repaired using the same methods and materials as the original. All single outlets shall be symmetrically located in each room. Where two or more outlets occur, they shall be spaced uniformly in straight lines with each other. All outlet boxes except those for recessed lighting fixtures shall be flush with the final surface finish. Each fixture shall be lamped per the fixture schedule.

1.03 Standards

A. Type of fixtures and other lighting equipment are specified by description and manufacturer's catalog numbers, keyed to symbols on drawings, (T-1, T-2, etc.) at each outlet. These fixtures have been selected as suitable to conform with the architectural pattern for each area with respect to light distribution, characteristics and finish of fixtures, proper fittings, mounting facilities and maintenance features.

B. Verify that electrical installation may be made in complete accordance with all pertinent codes and regulations and the original design.

C. In the event of discrepancy, immediately notify the architect. Do not proceed with installation in area of discrepancy until all such discrepancies have been fully resolved.

D. The data indicated on the drawings and in the specifications are as exact as could be secured, but their absolute accuracy is not guaranteed. Exact locations, distances, levels and other conditions will be governed by job decisions of the architect.

E. Electrical Contractor to furnish and install sheet rock fire enclosures for all recessed fixtures in fire rated ceilings. See Architectural Drawings for locations of rated ceilings.

F. Where a fixture type designation may have been omitted from the plans, it shall be the responsibility of the electrical contract bidder to contact the engineer in writing prior to the bid opening and determine which fixture type is intended at the location in question.

G. If the bidder fails to comply with this requirement, they shall furnish and install fixtures as instructed

by the Architect without additional cost to the Owner. No allowance will be made on behalf of the contractor who fails to comply with this requirement.

PART 2 - PRODUCTS

2.01 Lighting Fixtures

A. All fluorescent lighting fixtures shall be equipped with electronic ballasts as called for in the fixture schedule. All ballasts shall be externally and individually fused. Each fixture manufacturer shall certify and guarantee their fixture equipped with the above ballasts to operate satisfactorily at 30 degrees C ambient, rated voltage and mounted as indicated in schedules on drawings. Fluorescent lighting fixture manufacturers furnishing fixtures under these specifications shall furnish upon request certified test reports from an independent testing laboratory showing ballast case operating temperature of fixture when tested under UL conditions for labeling approval. Sound emission shall not exceed that of similar type ballasts.

B. Furnish Quiet, Energy Saving Type, Multiple Lamp Electronic Ballasts with sound rating "A" for all T-8 Lamps. Total harmonic distortion to be less than 10%.

C. High intensity discharge lighting fixtures shall be equipped with constant wattage type ballasts as manufactured by General Electric, Universal, Advance or Jefferson. All ballasts shall be high power factor. All high intensity discharge and fluorescent ballasts used in conjunction with outdoor mounted fixtures such as canopies, covered walks, post lights, floodlights, etc., shall be capable of starting the lamps at minus 20 degrees F temperature. Operating voltage shall be 277 volts or as noted in the schedules.

D. Furnish all fixtures of a certain type from the same manufacturer and catalog number.

E. Remove all exposed labels from fixtures.

2.02 Lamps

A. All lamps shall be as manufactured by G.E., Philips or Osram/Sylvania, and shall be new at the time of final inspection, no other lamp manufacturers will be approved. Unless noted otherwise in schedules, fluorescent lamps shall be energy efficient type T-8 or biax lamps. Lamps to be installed per the fixture schedule. All lamps to be delivered to the job in original unbroken cartons. See fixture schedule lamp column. Maintain the 3500^{o}K color temperature and CRI listing in all lamp types. All lamps shall meet EPA hazardous waste requirements and pass the Toxic Characteristic Leaching Procedure (TCLP) hazardous waste test, EPACT and green lights standards for lamp disposal.

PART 3 - EXECUTION

3.01 Installation

A. Coordinate the installation of electrical items with the schedule for work of other trades to prevent unnecessary delays in the total work.

B. Where lighting fixtures and other electrical items are shown in conflict with locations of structural members and mechanical or other equipment, furnish and install required supports and wiring to clear the encroachment.

C. Fixture Support:

(1) All fixtures shall be supported from structural members of building not by ceiling grid system where suspended or from wires suspending the ceiling grid system.

(2) It shall be the responsibility of the electrical contractor to supply and install the necessary equipment for the hanging of light fixtures (support at each corner of the fixture) independent of the ceiling, regardless of the type of ceiling or requirements. When laid in or hung in a suspended ceiling, they may negotiate with the ceiling contractor to add additional wires at each end of the fixture to hang them independent of the ceiling. This must be followed regardless of the type of ceiling or requirements. Each point provided for light fixture support shall be capable of holding 200lb. and shall not be attached to the ceiling or wall material. All surface mounted fixtures shall be supported from a structural channel. Suspended 2' x 4' fixtures shall be supported on all four corners with stem and canopy sets as described in fixture schedule.

F. Contractor shall submit a complete list of all fixtures, showing illustrations and descriptions of fixtures for approval before ordering, in accordance with General Conditions of this specification. Fixture mounting types must be checked against the ceiling types by the contractor prior to placing order. Coordinate with Architectural Drawings and ceiling schedules.

3.02 Testing

A. Upon completion of this portion of the work, furnish all personnel operating instructions and conduct all tests required to secure approval of the installation from all agencies having jurisdiction.

B. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than that required by the NEC. All systems shall show proper neutral connections.

3.03 Cleaning Up

A. Upon completion of all installations, lamping, and testing, thoroughly inspect all exposed portions of the electrical installation and completely remove all exposed labels, soil markings, and foreign materials. Wash all acrylic plastic lens in an anti-static bath just prior to final inspection and building occupancy.

END OF SECTION 16500